AUG 17 1990

I 72.12/10: 90-0012

OCS Information Program
MMS 90-0012

Alaska Update: September 1988-January 1990

ORIGINAL
COMPLETED

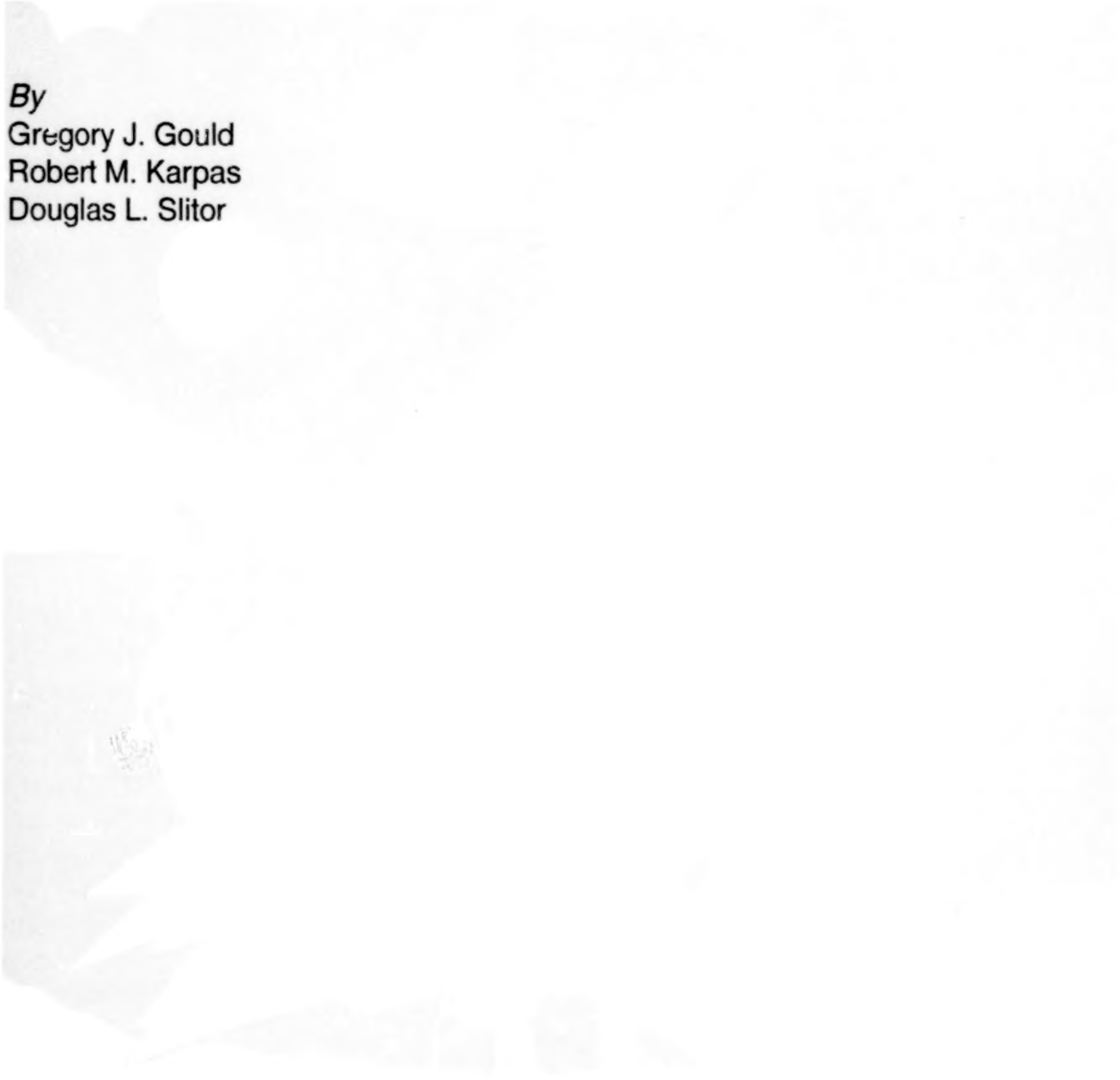
Outer Continental Shelf Oil & Gas Activities

MMS
U.S. Department of the Interior
Minerals Management Service
OCS Information Program

OCS Information Program
MMS 90-0012

Alaska Update: September 1988-January 1990

Outer Continental Shelf Oil & Gas Activities



By
Gregory J. Gould
Robert M. Karpas
Douglas L. Slitor

U.S. Department of the Interior
Minerals Management Service
OCS Information Program

Herndon, Virginia
1990

BLANK PAGE

Preface

The Outer Continental Shelf Information Program (OCSIP) was mandated by the 1978 Amendments to the OCS Lands Act (43 U.S.C. 1352). To meet the requirements of this mandate, the OCSIP has made available two types of documents (summary reports and indexes) that have described oil- and gas-related activities in each of the four MMS OCS Regions: the Alaska, the Atlantic, the Gulf of Mexico, and the Pacific. Many facets of the Federal oil and gas leasing program have changed significantly in the 10 years since inception of the OCSIP. In recognition of these changes, and in an attempt to reduce administrative costs, the OCSIP has recently modified its publications program and now produces the following documents:

- a streamlined, annual *Update* report for each of the four MMS OCS Regions (formerly the Summary Reports);
- a biennial *National OCS Compendium* that presents historical information on all of the OCS Regions;
- a map plate series detailing regional offshore and onshore information for the Alaska and Pacific OCS Regions; and
- an annual *OCS Directory* of Federal and State agencies and their OCS responsibilities.

To order any of these documents, or for more information about them, contact the OCSIP at the following address and telephone number:

OCS Information Program
Office of Offshore Information & Publications
Minerals Management Service, MS 4610
381 Elden St.
Herndon, VA 22070-4817
(703) 787-1080 or (FTS) 393-1080

Abbreviations and Acronyms

A

ACMP - Alaska Coastal Management Program
ACOE - Army Corps of Engineers
ANGTS - Alaska Natural Gas Transportation System
ANILCA - Alaska National Interest Lands Conservation Act of 1980
ANWR - Arctic National Wildlife Refuge
API - American Petroleum Institute
APRI - Alaska Pacific Refinery, Inc.
ARCO - Atlantic Richfield Company

B

bbl - barrel
BBO - billion barrels of oil
Bcfd - billion cubic feet per day
BOE - barrels of oil equivalent
BP - British Petroleum
bpcd - barrels per calendar day
bpd - barrels per day
bph - barrels per hour

C

CER - categorical exclusion review
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
CIDS - concrete island drilling structure
cm - centimeter
CPC - Coastal Policy Council
CRSA - coastal resource service area
CWA - Clean Water Act

D

DEC - Department of Environmental Conservation (Alaska)
DEW - Defense Early Warning
DNR - Department of Natural Resources (Alaska)
DOC - Department of Commerce
DOE - Department of Energy
DOI - Department of the Interior
DOT - Department of Transportation
DST - deep stratigraphic test

E

EA - environmental assessment
EIS - environmental impact statement
ELF - economic limit factor
EMAG - Endicott Mitigation Advisory Group
EP - Exploration Plan
EPA - Environmental Protection Agency
EPCA - Energy Policy and Conservation Act

F

FEIS - final environmental impact statement
FR - *Federal Register*
FWS - Fish & Wildlife Service
FY - fiscal year

G

gal - gallon
GAO - Government Accounting Office
gph - gallons per hour
G&G - geological and geophysical

I

IMO - International Maritime Organization

K

km - kilometer

L

LNG - liquified natural gas

M

m - meter
mg - milligram
mm - millimeter
Mbbl - thousand barrels
Mbpd - thousand barrels per day
Mcf - thousand cubic feet
Mcfd - thousand cubic feet per day
MMbbl - million barrels
MMBO - million barrels of oil
MMbpcd - million barrels per calendar day
MMbpd - million barrels per day
MMcfd - million cubic feet per day
MMgal - million gallons
MMS - Minerals Management Service

N

NAS - National Academy of Sciences
NCP - National Contingency Plan
NEPA - National Environmental Policy Act
NGL - natural gas liquids
NMFS - National Marine Fisheries Service
NOAA - National Oceanic & Atmospheric Administration
NOI - Notice of Intent
NOPPB - National Ocean Pollution Policy Board
NOS - Notice of Sale
NPDES - National Pollutant Discharge Elimination System
NRC - National Response Center
NRDAC - Natural Resource Damage Assessment Council
NRDC - Natural Resources Defense Council
NRT - National Response Team
NTL - Notice to Lessees
NTSB - National Transportation Safety Board

continued

O
OCS - Outer Continental Shelf
OCSIP - Outer Continental Shelf Information Program
OCSLA - Outer Continental Shelf Lands Act
OPD - official protraction diagram
OSC - On-Scene Coordinator
OSIM - Office of Strategic & International Minerals
OTA - Office of Technology Assessment

P
Pactex - Pacific-Texas Pipeline
PARS - Port Access Route Study
PIRO - Petroleum Industry Response Organization
PNOS - Proposed Notice of Sale
PRESTO - Probabilistic Resource Estimates—Offshore

R
RCRA - Resource Conservation and Recovery Act
RRT - Regional Response Team

S
SDR - seasonal drilling restriction
SI - International System of metric units
SSC - Scientific Support Coordinator
SSDC - single steel drilling caisson
SWEPI - Shell Western Exploration & Production (E&P), Inc.

T
TAGS - Trans-Alaska Gas System
TAPS - Trans-Alaska Pipeline System
Tcf - trillion cubic feet
TLWP - tension-leg well platform
TPU - Technical Publications Unit

U
U.S.C. - United States Code

V
VLCC - very large crude carrier

English-Metric Conversion

Measurements in this document are reported in the format that reflects the most common usage. The following table provides the factors for converting measurements to either U.S. Customary units or the International System (SI) of metric units.

U.S. Customary unit	**(multiply by to obtain)**	**SI Metric unit**
inches	2.54	centimeters
feet	0.3048	meters
statute miles	1.609	kilometers
nautical (geographic) miles	1.852	kilometers
acres	0.4047	hectares
barrels (U.S.) petroleum	0.15897	cubic meters
gallons	3.785	liters
cubic feet	0.02832	cubic meters
tons, long (deadweight)	1.016	metric tons

SI Metric unit	**(multiply by to obtain)**	**U.S. Customary unit**
centimeters	0.3937	inches
meters	3.281	feet
kilometers	0.6214	miles, statute
kilometers	0.5400	miles, geographic (nautical)
hectares	2.47105	acres
cubic meters	6.290	barrels (petroleum, 1 bbl = 42 gal)
liters	0.2642	gallons
metric tons	0.9842	tons, long (deadweight)(2,240 lb)

NOTE: Distances on the Federal Outer Continental Shelf and on land are measured in statute miles.
Distances on the offshore State lands are measured in nautical (geographic) miles.
Generally, coastal States were granted jurisdiction over offshore lands to a distance of 3 nautical miles from their coasts by the Submerged Lands Act (43 U.S.C. 1301, et seq.). The offshore jurisdiction of Texas and Florida (on its gulf coast side only) extends to 3 marine leagues (approximately 10.35 statute miles) for historic reasons.

Contents

Preface, iii

Abbreviations and Acronyms, iv

English-Metric Conversion, vi

Introduction, 1

1. Offshore Mineral, Oil, and Gas Resources of the Alaska Region, 5
- History of Gold Exploration in Norton Sound, **5**
- Geologic Summary of the Norton Sound Lease Sale Area, **5**
- Geological and Geophysical Permit Data, 8
- Estimated Offshore Oil and Gas Resources and Reserves, **10**
- Additional Readings, **10**

2. Magnitude and Timing of Offshore Developments, 15
- July 1987 Final 5-Year OCS Oil and Gas Leasing Program, **15**
    - Draft Supplement to the Final EIS, **15**
    - Federal OCS Oil and Gas Leasing in the Alaska OCS Region, **18**
    - OCS Lease Sale 92 (North Aleutian Basin), **20**
    - OCS Lease Sales Scheduled for the Alaska OCS Region, **22**
- OCS Mining Program, Norton Sound Lease Sale, **22**
- Development of the 5-Year OCS Oil and Gas Leasing Program, Fall 1991 to Fall 1996, **24**
- Postlease Developments on the Alaska OCS, **26**
    - Beaufort Sea Planning Area, **26**
        - Belcher Prospect, **26**
        - Galahad Prospect, **26**
        - Northstar/Seal Island Discovery, **28**
    - Chukchi Sea Planning Area, **29**
        - Klondike Prospect, **29**
        - Burger Prospect, **29**
        - Popcorn Prospect, **30**
- Alaska State Offshore Oil and Gas Program, **30**
    - State of Alaska Lease Sales, **30**
    - Exploration in State Waters and Coastal Areas, **31**
        - Point McIntyre Prospect, **32**
        - Karluk Prospect, **35**
        - Stinson Prospect, **35**
        - Badami Prospect, **36**
        - Point Thompson Unit, **36**

Contents

2. Magnitude and Timing of Offshore Developments...cont.

Development in State Waters and Coastal Areas, **37**
        Niakuk Prospect, **37**
        Prudhoe Bay Unit, **37**
        West Sak Field, **38**
        Endicott Field, **39**
        Other North Slope Coastal Fields, **39**
    Production in Alaska, **39**
Additional Readings, **40**

3. Oil and Gas Transportation and Onshore Support Facilities, 43
Vessel Transportation, **43**
    Arctic Sealift, **43**
    Regulation of Tankers Transporting Alaskan Crude, **43**
Crude Oil Pipelines, **44**
    Alyeska Pipeline, **44**
    All-American Pipeline/Pacific-Texas Pipeline, **44**
Natural Gas Pipelines, **45**
    Alaska Natural Gas Transportation System, **45**
    Trans-Alaska Gas System, **46**
Exportation of Alaskan Crude Oil, **46**
    Cook Inlet Crude Oil, **46**
    North Slope Crude Oil, **47**
Onshore Support Facilities, **48**
    Refineries, **48**
    Gas Processing Facilities, **50**
    Construction Facilities, **50**
Additional Readings, **50**

4. Issues Related to OCS Activities, 51
Alaska Coastal Zone Management Program, **51**
Distribution of Section 8(g) Funds, **51**
Arctic National Wildlife Refuge, **53**
Economic Limit Factor, **54**
Control of Offshore Drilling Wastes, **54**
    National Pollutant Discharge Elimination System, **54**
    Resource Conservation and Recovery Act, **55**
Additional Readings, **55**

Continued

Appendix A: Exxon Valdez Oil Spill in the Prince William Sound, Alaska, 57

- Chronology of Spill Events, **57**
- Wildlife Rescue Effort and Losses, **64**
- Chronology of the Department of the Interior and the Minerals Management Service Response to the Spill, **64**
- Chronology of the Oil Industry's Response to the Spill, **65**
- Chronology of Congressional Response to the Spill, **69**
- Chronology of Other Federal Agency Responses to the Spill, **70**
- Chronology of State Agency Responses to the Spill, **71**
- Chronology of Studies Proposed or Initiated in Response to the Spill, **72**
- Fall 1989 and Winter 1990 Cleanup Program, **74**

Appendix B: Bibliography of OCS Information Reports, 77

- Alaska Region, **77**
  - Arctic Subregion Summary Reports and Updates, **77**
  - Bering Sea Subregion Summary Reports and Updates, **77**
  - Gulf of Alaska Subregion Summary Reports and Updates, **77**
  - Regionwide Alaska Summary Reports and Updates, **78**
  - Alaska Indexes, **78**
  - Alaska Summary/Index, **78**
- Atlantic Region, **78**
  - North Atlantic Summary Reports and Updates, **78**
  - Mid-Atlantic Summary Reports and Updates, **78**
  - South Atlantic Summary Reports and Updates, **78**
  - Regionwide Atlantic Summary Report, **79**
  - Atlantic Indexes, **79**
  - Atlantic Summary/Index, **79**
- Gulf of Mexico Region, **79**
  - Gulf of Mexico Summary Reports and Updates, **79**
  - Gulf of Mexico Indexes, **80**
- Pacific Region, **80**
  - Pacific Summary Reports and Updates, **80**
  - Pacific Indexes, **80**
  - Pacific Summary/Index, **80**
- National, **80**
- Other Documents of Interest, **81**
- Other Items of Interest, **81**

Contents—continued

Figures

1. Map showing Alaska OCS Region planning areas and official protraction diagrams, **2**
2. Graph showing prices of selected crude oils compared against rig count, **3**
3. Map showing generalized bathymetry of the OCS Mining Program, Norton Sound Lease Sale, **7**
4. Flowchart showing the prelease phase of the OCS oil and gas leasing process, **16**
5. Chart showing the July 1987 Final 5-Year OCS Oil and Gas Leasing Program milestones, **17**
6. Top 10 Alaska OCS leaseholders by percentages of acreage held, January 1990, **20**
7. Chart listing Alaska OCS Region lease sale stipulations, **21**
8. Flowchart showing the postlease phase of the OCS oil and gas leasing process, **25**
9. Chart showing major State of Alaska offshore leaseholders by percentages of acreage held, January 1990, **32**
10. Map showing areas of contact of oil spilled from the *Exxon Valdez*, **59**

Tables

1. Federal and State geological and geophysical data acquisition and permits issued, **9**
2. Estimates of undiscovered economically recoverable oil and gas resources in the Alaska OCS Region as of January 1987, **11**
3. Estimated reserves of State of Alaska oil and gas fields as of January 1, 1990, **13**
4. Lease sale history of the Alaska OCS Region as of January 1, 1990, **19**
5. Dates of and *Federal Register* notices for significant prelease steps for proposed Alaska OCS lease sales from January 1987 through January 1990, **23**
6. Alaska OCS drilling history as of January 1, 1990, **27**
7. Shell Western E&P, Inc.'s proposed exploratory well locations, **30**
8. Proposed 1990 Alaska 5-year oil and gas leasing program, **31**
9. Status of Alaska State coastal exploration, development, and production projects, **33**
10. State of Alaska offshore production statistics as of November 30, 1989, **41**
11. States that receive Alaskan crude oil, **47**
12. Actual or potential Alaska OCS Region support facilities, **49**
13. Status of district programs of the Alaska Coastal Zone Management Program, **52**
14. Summary matrix of *Exxon Valdez* Oil Spill, **58**

Introduction

The Federal offshore oil and gas program in the Alaska Outer Continental Shelf (OCS) Region dates back to 1976. Detailed information on the history of Federal offshore oil and gas activities has been compiled into an *OCS National Compendium*, and is available from the OCS Information Program (OCSIP) at the address listed in the Preface of this document. Many other documents have been prepared summarizing the various aspects of oil and gas activities in the Alaska OCS Region. Appendix B provides a listing of these reports and other reports prepared by the OCSIP, along with information on how to obtain copies.

As shown in figure 1, the Alaska OCS Region is divided for administrative purposes by the Minerals Management Service (MMS) into 15 planning areas. Please refer to this figure as you read through this report. As figure 1 shows, these planning areas are subdivided into official protraction diagrams (OPD's). The sidebar on official protraction diagrams explains their use and availability.

The Alaska OCS Region includes approximately 1,300 million acres covering approximately 2 million square miles, with a maximum water depth of about 25,000 feet (7,600 meters). The Alaska OCS Region has offered over 98 million acres in the 15 lease sales held since 1976. As a result of these sales, the MMS has leased 8.2 million acres and has received over $6.4 billion in bonus bids.

This version of the *Alaska Update* will provide information related to offshore oil-and-gas and hard mineral activities in the Alaska OCS Region for the period September 1, 1988, through January 1, 1990. During this period, the offshore oil and gas industry in the Alaska OCS Region continued to express a high level of interest in portions of the OCS adjacent to Alaska. In the Chukchi Sea Planning Area, industry began preliminary work on a number of new prospects. These prospects were leased as a result of OCS Lease Sale 109. This lease sale set several new records last year for the Alaska OCS Region, including number of tracts and acres bid on and number of tracts and acres leased. The first exploratory well for this planning area was spudded in July 1989 by Shell Western Exploration & Development (E&P), Inc.

Throughout the document, the price of oil over the past 10 years is cited for various reasons. For your information, we have provided a graph in figure 2 that displays the prices for selected crude oils, as well as the offshore rig count for the past 10 years. The price of oil, as well as the number of working offshore rigs, has stabilized over the past 2 years. This edition of the *Alaska*

Official Protraction Diagrams

The Alaska OCS Region planning areas are portrayed on official protraction diagrams (OPD's). The OPD's are based on the Universal Transverse Mercator Grid/Projection System. Alaska OPD's bear a unique numerical designator. Each OPD covers an area of 1° latitude by 3° longitude that is divided into blocks. Individual blocks, the basic leasing units, are properly referenced by citing both the OPD and block numbers.

An index to Alaska OCS Region OPD's, as well as individual OPD's, can be ordered from the following office at a cost of $2 each:

Alaska OCS Regional Library
Minerals Management Service
949 East 36th Ave., Room 110
Anchorage, Alaska 99508-4302
(907) 261-4438

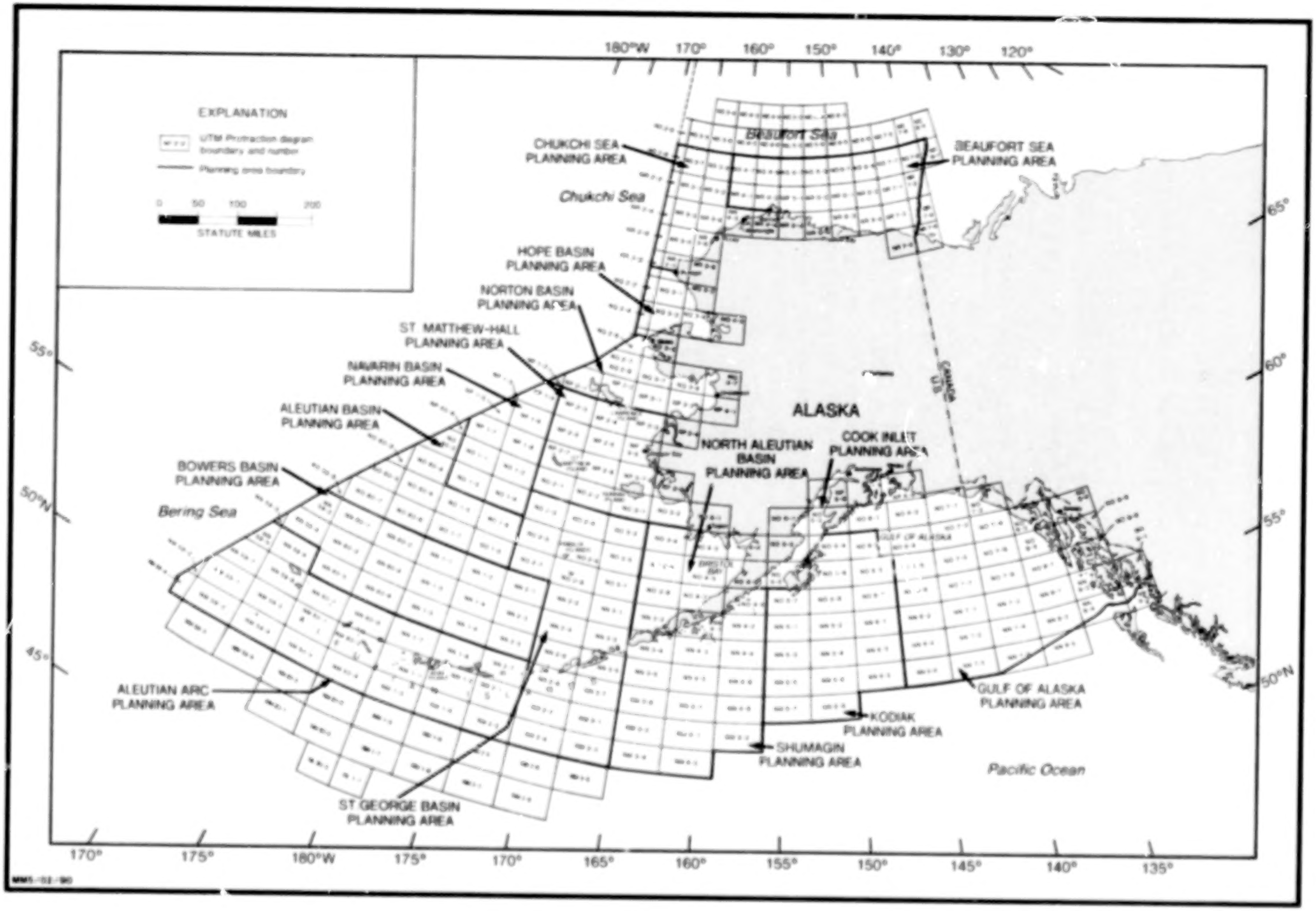

EXPLANATION
UTM Protraction diagram boundary and number
Planning area boundary
0 50 100 200
STATUTE MILES
180°W
170°
160°
150°
140°
130°
120°
Beaufort Sea
Chukchi Sea
CHUKCHI SEA PLANNING AREA
BEAUFORT SEA PLANNING AREA
HOPE BASIN PLANNING AREA
NORTON BASIN PLANNING AREA
ST. MATTHEW-HALL PLANNING AREA
NAVARIN BASIN PLANNING AREA
ALEUTIAN BASIN PLANNING AREA
BOWERS BASIN PLANNING AREA
Bering Sea
ALASKA
CANADA
U.S.
NORTH ALEUTIAN BASIN PLANNING AREA
COOK INLET PLANNING AREA
GULF OF ALASKA
ALEUTIAN ARC PLANNING AREA
ST GEORGE BASIN PLANNING AREA
SHUMAGIN PLANNING AREA
KODIAK PLANNING AREA
GULF OF ALASKA PLANNING AREA
Pacific Ocean
65°
60°
55°
50°N
45°
170°
175°
180°W
175°
170°
165°
160°
155°
150°
145°
140°
135°
MMS-02/90

Figure 1. *Alaska OCS Region planning areas and official protraction diagrams.*

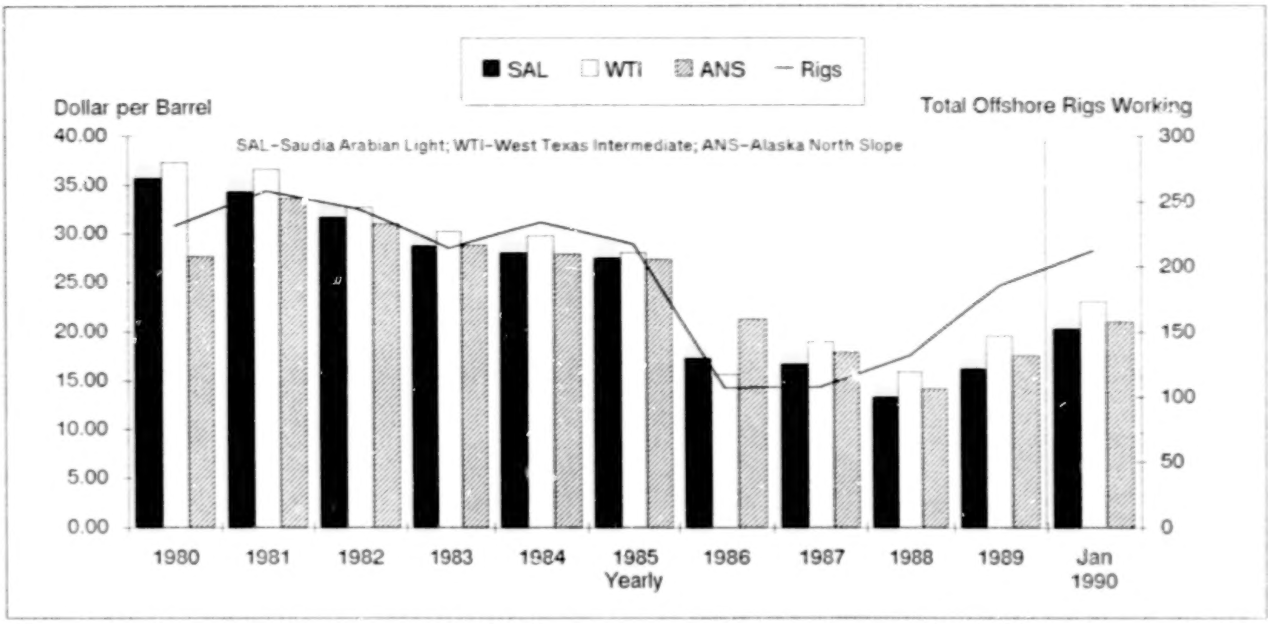


Figure 2. *Prices of selected crude oils compared against rig count.*

Update will provide information regarding recent trends in the Alaska OCS Region.

On March 24, 1989, the *Exxon Valdez* oil tanker ran aground on Bligh Reef in the Prince William Sound, spilling over 240,000 barrels of No. 6 crude oil. While the tanker accident was not related in any way to Federal OCS oil and gas activities, the Secretary of the Interior decided in May 1989 to delay OCS Lease Sale 114, in the Gulf of Alaska, to provide more time to gather additional information on the effect this spill had on the environment. Appendix A provides a detailed chronology and summary of events related to the *Exxon Valdez* oil spill in the Prince William Sound.

[illegible]

1. Offshore Mineral, Oil, and Gas Resources of the Alaska Region

Previous Summary/Index reports have provided geologic information about the Alaska OCS Region. Please refer to these reports, listed in Appendix B, for additional geologic information. This edition of the *Alaska Update* provides a brief history of gold exploration in Norton Sound along with a summary of the geology of the Norton Sound Lease Sale area. Information for this section was extracted from the November 1988 draft environmental impact statement and the geology report prepared by the Alaska OCS Region for this sale. Please refer to these documents and the "Additional Readings" section at the end of this chapter for more detailed information.

History of Gold Exploration in Norton Sound

The southern Seward Peninsula, particularly the area surrounding Nome on the north side of Norton Sound, has been a center of gold exploration since slightly before the turn of the century. The gold has been found primarily in placer deposits, which were first mined by panning and pick-and-shovel methods. These methods were superseded by larger scale gold-dredging operations made possible around 1920 by the introduction of an economical method of thawing, whereby unminable frozen ground is injected with cold water. Interest in Nome area gold later declined because of World War II production restrictions and the declining relative value of gold (fixed at $35 per troy ounce) during post-war inflation. By 1962, large-scale gold mining on the Seward Peninsula had essentially ceased. Since the removal of price ceilings on gold during the early 1970's, however, gold prices have risen and interest in gold mining has gradually returned.

Reports indicating the possibility of offshore gold deposits (U.S. Bureau of Mines, 1968; Nelson and Hopkins, 1972; Tagg and Greene, 1973), along with improvements in offshore dredging capabilities, led to heightened interest in gold exploration in the offshore Nome area in the 1980's. WestGold (formerly Inspiration Gold, Inc.) acquired State leases within the 3-geographic-mile limit (as granted by the Submerged Lands Act), and has begun active mining operations employing a large, ocean-going dredge, the *BIMA*. The *BIMA* was relatively successful in offshore operations in 1987 and 1988 extracting 36,000 and 35,000 troy ounces of gold, respectively. The success of *BIMA* stimulated industry interest in further operations in the area, including areas in Federal waters. In response to this interest, the OCS Mining Program Norton Sound Lease Sale was proposed for the Federal offshore area south and east of Nome. (See ch. 2 for more information regarding the timing of this minerals lease sale).

Geologic Summary of the Norton Sound Lease Sale Area

The sale area lies in the northwestern part of Norton Sound, which is a broad embayment in the northeastern Bering Sea. The sale area is composed of two areas located approximately 5-22 km offshore. The western part of the sale area extends along the coast about 20 km west and east of Nome, and the eastern part lies east of Safety Sound and extends along the coast for about 25 km. The seafloor within Norton Sound generally lies at depths between 10 and 20 m and slopes to the west. Water depths within the sale area range from about 20 m to slightly more than 30 m. The principal bathymetric feature is an east-west trending trough extending through the western two-thirds of the sale area. The axis of the trough lies parallel to the shoreline and is slightly more than 30 m deep. (See fig. 3.)

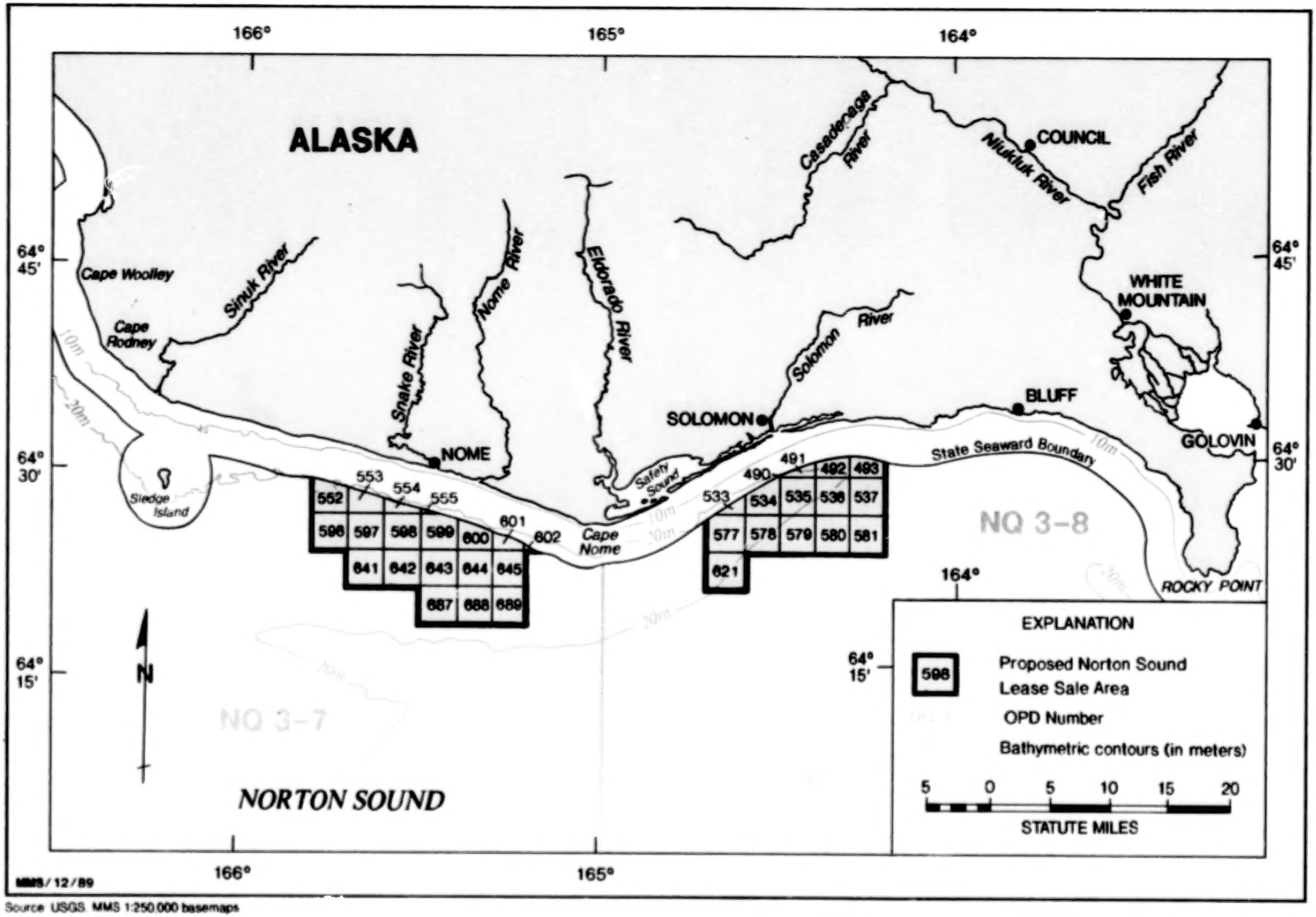
The sediments of the continental shelf in the sale area are part of a sedimentary environment that has been affected by glacial, alluvial, eolian (wind), and marine sedimentary processes. During the glacial periods of the Pleistocene Epoch when sea level was lower, the present-day continental shelf of Norton Sound became part of a continental regime. Rivers and streams cut channels throughout the exposed shelf. Valley glaciers formed in the hills and mountains north of Nome and extended into the present-day marine environment off the Seward Peninsula. These glaciers eroded mineralized bedrock and older alluvial and beach placers and deposited gold-bearing sediments as much as 5 km beyond the present shoreline of the Seward Peninsula. The coastal plain of Nome has been overridden by glacial ice at least twice during the Pleistocene Epoch. The glacial moraine and outwash deposits are composed of a heterogeneous mixture of silt, sand, gravel, and larger size particles. The continental streams also eroded material from the glacial deposits.

The Seward Peninsula contains many active and inactive lode and placer mines and prospects, as well as known occurrences of metal-bearing minerals. The metal-bearing lodes, or veins, that contain important resources or that have produced significant amounts of ore include deposits of tin (cassiterite), tungsten (scheelite), and beryllium ores and gold. Small amounts of antimony, bismuth, copper, silver, lead, and mercury also have been recovered, but no currently economic deposits of these metals have been identified. Zinc, arsenic, molybdenum, uranium, thorium, and rare-earth minerals are also present. Placer deposits of the Seward Peninsula also have produced gold and other minerals, and the beach deposits have been a major source of gold in the Nome area. Common heavy minerals (specific gravity greater than 4.0) include scheelite, magnetite, ilmenite, hematite, stibnite, cassiterite, garnet, and bismuthinite.

During the interglacial periods, the sea level rose and sediments deposited during the transgression buried many features and filled the stream channels; these sediments consist of marine sandy silt interbedded with very fine grained sand layers. Currents and waves of the transgressing and regressing seas removed the finer and lighter particles from exposed glacial and weathered bedrock deposits; this winnowing process produced the lag gravel deposits that overlay the glacial deposits and bedrock. Beaches were also formed by the transgressing sea where the shoreline changed less rapidly. Relict beach deposits have been observed on the present-day shelf south of Nome, at depths of about 11, 21, and 24 m.

The last transgression began about 12,000-13,000 years ago. The period between 8,000 and 11,000 years before the present was a time of substantial climatic warming accompanied by continental shelf flooding. This period represents a transition from the late Pleistocene to the early part of the Holocene (Recent or Modern) Epoch.

Thus, the surface sediments of the Norton Sound are both relict and modern. The relict sediments were deposited prior to and during the last transgression. They cover most of the seafloorsurface in the northern part of Norton Sound. Gravels occur as lag deposits that overlie bedrock and glacial deposits. Gravels that overlie bedrock are found (1) off the northwestern and northeastern coasts of St. Lawrence Island, (2) in the Bering Strait, and (3) along the



Source USGS MMS 1:250,000 basemaps

Figure 3. *Generalized bathymetry of the OCS Mining Program, Norton Sound Lease Sale.*

coast of the Seward Peninsula between Cape Prince of Wales and Port Clarence, from Cape Rodney to Sledge Island, and off Cape Nome. Glacial lag gravels occur off the northcentral coast of St. Lawrence Island, in the Bering Strait, off the Chukchi Peninsula coast, and off the Seward Peninsula coast east of Cape Nome and in the vicinity of Nome. These lag deposits are relatively thin; they may be as much as 60 cm thick, but the average thickness is about 30 cm.

More than 4.5 million troy ounces of gold have been recovered from onshore placer deposits in the Nome District since 1899. Most of the recovery was from strandline deposits such as the modern beach at Nome or ancient, high sea-stand beaches further inland. The gold was initially eroded from mineralized veins in bedrock on Seward Peninsula and reworked by fluvial, glacial, and marine processes. During the Pleistocene, advancing glaciers moved gold-bearing sediments onto the continental shelf of Norton Sound. Enrichment factors such as marine scour and fluvial erosion have reworked some of the gold from these glacial deposits, concentrating it into minable placers. Since 1986, gold ore has been dredged in State waters within the area covered by glacial deposits. The maximum annual recovery to date was 36,700 troy ounces in 1987.

In the Federal OCS, submerged beach ridges, deposited during the Pleistocene low stands of sea level, occur on the sea bottom at depths of 21, 24, and 27 m. It is possible that enriched placer deposits similar to those mined onshore may exist in Federal waters. However, this would require a nearby source for the gold, such as the glacial deposits, because coarse gold particles (greater than 1 mm in diameter or 1 mg in weight) are never transported very far by moving water. The outer limit of auriferous glacial deposits offshore from Nome coincides very closely with the 3-mile limit, which suggests that the resource potential of sediments in Federal waters is less than that of sediments in State waters. The present understanding of the distribution of offshore glacial deposits is based on surficial sediment mapping and seismic profile interpretation. Subsurface samples from the OCS are limited to data from a few proprietary geologic and geophysical surveys; therefore, there is little public information on ore grade and ore-body volume from Federal waters.

Geological and Geophysical Permit Data

Geological and geophysical (G&G) surveys and analyses provide most of the resource and hazards information used by Government and industry regarding the oil and gas potential of offshore areas. The collecting of G&G data begins prior to the leasing of Federal land and continues throughout the term of offshore mineral leases. Table 1 presents data on both Federal and State G&G exploration permits issued. Title 30, part 251, of the Code of Federal Regulations (CFR) contains the regulations regarding acquisition of G&G information on the OCS. The MMS administers data acquisition through these regulations. The purpose of these regulations is to prescribe (1) when a permit or the filing of a notice is required to conduct G&G exploration on the OCS, as well as the operating procedures for conducting exploration, (2) the disclosure of data and information, and (3) the conditions for reimbursement of certain costs.

Permit applications for G&G activity must be submitted to MMS in accordance with the requirements outlined in these regulations and explained further in Letter(s) to Permittees. The State of Alaska is not involved in the review process for specific G&G applications prior to issuance of the permit, except for deep stratigraphic tests (DST's). Environmental reports are required

Table 1. *Federal and State geological and geophysical data acquisition and permits issued*

Federal Mileage Acquired*

Fiscal Years

Planning Area	**1964-85***	**1986**	**1987**	**1988**	**1989**	**Total**
Beaufort	59,347	6,104	4,500	8,752	880	79,583
Chukchi	68,878	14,885	46,574	6,752	10,745	147,834
Gulf of Alaska	35,976	315	0	0	396	36,687
Hope	7,357	0	1,325	0	0	8,682
Kodiak	31,038	0	0	0	0	31,038
Lower Cook Inlet	26,949	0	550	188	1002	28,689
Navarin	68,294	340	579	1,055	0	70,268
N. Aleutian	45,084	354	1,557	0	0	46,995
Norton	30,322	0	1,475	0	166	31,963
Shumagin	7,157	0	23,287	0	0	30,444
St. George	74,723	620	950	38	0	76,331
St. Matthew	7,341	0	1,354	0	0	8,695
Total	462,466	22,618	82,151	16,785	13,189	597,209

Federal Permits Issued

Calendar Years

Planning Area	**1964-85**	**1986**	**1987**	**1988**	**1989**	**Total**
Beaufort	235	6	10	5	5	261
Chukchi	63	12	3	4	5	87
Gulf of Alaska	157	0	0	0	3	160
Hope	14	0	0	0	0	14
Kodiak	25	0	0	0	0	25
Lower Cook Inlet	123	0	0	3	2	128
Navarin	56	0	0	0	0	56
N. Aleutian	87	0	0	1	0	88
Norton	52	0	2	0	0	54
Shumagin	15	0	0	0	0	15
St. George	80	0	0	0	0	80
St. Matthew	8	0	0	0	0	8
Total	915	18	15	13	15	976

State Mileage/Permits Issued

Calendar Years

Planning Area	**1964-85**	**1986**	**1987**	**1988**	**1989**	**Total**
Beaufort	3,134 / 10	766 / 6	1,127 / 9	430 / 1	0 / 0	5,457 / 26
Chukchi	8,000 / 1	125 / 2	49 / 1	0 / 0	0 / 0	8,174 / 4
North Aleutian	259 / 8	0 / 0	0 / 0	0 / 0	0 / 0	259 / 8
South Aleutian	45 / 1	0 / 0	0 / 0	0 / 0	0 / 0	45 / 1
St. George	30 / 1	0 / 0	0 / 0	0 / 0	0 / 0	30 / 1
Cook Inlet	618 / 4	1,130 / 5	173 / 1	6,000 / 3	0 / 0	7,921 / 13
Gulf of Alaska	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Total	12,086 / 25	2,021 / 13	1,349 / 11	6,430 / 4	0 / 0	21,886 / 53

* Mileages include deep penetration CDP seismic, high-resolution seismic, gravity, and aeromagnetic data.

NOTE: Mileage acquired in 1 year may be as a result of permits issued in previous years.

in accordance with 30 CFR 251.6-2(6) for DST's, and when required under a coastal zone management program, must receive State concurrence prior to approval of any activities covered under the permit.

After receiving a G&G permit application, MMS either determines that the G&G activities are included under a categorical exclusion review (CER) or prepares an environmental assessment (EA) in accordance with NEPA and other applicable MMS policies and regulations. Most G&G activities are included under a CER. Activities that (1) include the drilling of DST holes, (2) involve the use of solid or liquid explosives, or (3) have the potential to significantly affect the quality of the human environment, require the preparation of an EA.

Estimated Offshore Oil and Gas Resources and Reserves

Section 606(d) of the OCS Lands Act Amendments (43 U.S.C. 1865(d)) requires that the Department of the Interior conduct a continuing investigation to determine the availability of all oil and natural gas produced or located on the OCS. This investigation includes both estimates of the total discovered crude oil and natural gas reserves and undiscovered economically recoverable resources on the OCS. The MMS estimates are based primarily on geologic and geophysical data collected by staff geologists and on related information gathered from the oil industry.

Table 2 presents the current undiscovered economically recoverable oil and gas resource estimates for Alaska OCS planning areas. For a discussion on how these resource estimates are derived, refer to the report "Estimates of Undiscovered Conventional Oil and Gas Resources in the United States — A Part of the Nation's Energy Endowment." This report is available free from MMS, Technical Publications Unit, 381 Elden St., Herndon, VA 22070.

Currently, within Federal waters there are no economic reserves. This condition may change in the future, as discoveries on both Federal and State submerged lands are further delineated. Table 3 displays reserve figures for both offshore and onshore State lands in Alaska.

Additional Readings

Berg, H.C., and Cobb, E.H. 1967. *Metalliferous lode deposits of Alaska*: U.S. Geological Survey Bulletin 1246, 254 p.

Cobb, E.H. 1973. *Placer deposits of Alaska*: U.S. Geological Survey Bulletin 1374, 213 p.

Hess, G.R., and Nelson, C.H. 1982. *Geology report for proposed Norton Sound OCS sand and gravel lease sale*: U.S. Geological Survey Open-File Report 82-997, 47 p.

Kaufman, D.S. , and Hopkins, D.M. 1986. *Glacial history of the Seward Peninsula*, in Hamilton, T.D., Reed, K.M., and Thorson, R.M., (eds.), *Glaciation in Alaska—the geologic record*: Alaska Geological Society, p. 51-78.

Mulligan, J.J. 1967. *Gold placers of the Nome coastal plain*: U.S. Bureau of Mines Situation Report No. 13, 9 p.

Nelson, C.H., and Hopkins, D.M. 1972. *Sedimentary processes and distribution of particulate gold in the northern Bering Sea*: U.S. Geological Survey Professional Paper 689, 27 p.

U.S. Bureau of Mines. 1968. *Sample drilling seafloor heavy metals placer deposits off Alaska's Nome beach—the Bureau of Mines 1967 offshore campaign*: Unpublished Final Draft Report, Marine Minerals Technology Center, 207 p.

U.S. Department of the Interior. 1989. *Estimates of Undiscovered Conventional Oil and Gas Resources in the United States—A Part of the Nation's Energy Endowment*. 44 p.

Tagg, A.R., and Greene, H.G. 1973. *High-resolution seismic survey of an offshore area near Nome, Alaska*: U.S. Geological Survey Professional Paper 759-A, 23 p.

Table 2. *Estimates of undiscovered economically recoverable oil and gas resources in the Alaska OCS Region as of January 1987*

Planning Area	Conditional oil			Conditional gas			MP -HC (1)	Risked mean oil	Risked mean gas	Risked BOE(2)
	95% case	Mean case	5% case	95% case	Mean case	5% case				
Arctic Subregion:										
Beaufort Sea(1)										
Leased and unleased	0.55	1.44	4.02	0.00	0.00	0.00	0.14	0.21	0.00	0.21
Unleased	0.31	0.87	3.39	0.00	0.00	0.00	0.14	0.12	0.00	0.12
Leased	0.32	0.79	1.87	0.00	0.00	0.00	0.12	0.09	0.00	0.09
Chukchi Sea(1)										
Leased and unleased	1.03	2.73	5.41	0.00	0.00	0.00	0.22	0.59	0.00	0.59
Unleased	1.03	2.73	5.41	0.00	0.00	0.00	0.22	0.59	0.00	0.59
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hope Basin										
Leased and unleased	0.20	0.66	1.96	0.00	0.00	0.00	0.01	*	0.00	*
Unleased	0.20	0.66	1.96	0.00	0.00	0.00	0.01	*	0.00	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bering Sea Subregion:										
Norton Basin										
Leased and unleased	N/A	0.58	N/A	0.00	0.00	0.00	<0.01	*	0.00	*
Unleased	N/A	0.17	N/A	0.00	0.00	0.00	<0.01	*	0.00	*
Leased	N/A	0.51	N/A	0.00	0.00	0.00	<0.01	*	0.00	*
Navarin Basin										
Leased and unleased	0.17	1.14	4.95	0.00	0.00	0.00	0.03	0.03	0.00	0.03
Unleased	0.12	0.90	4.32	0.00	0.00	0.00	0.03	0.03	0.00	0.03
Leased	0.05	0.33	1.03	0.00	0.00	0.00	0.03	0.01	0.00	0.01
St. Matthew-Hall										
Leased and unleased	*	*	*	*	*	*	*	*	*	*
Unleased	*	*	*	*	*	*	*	*	*	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aleutian Basin										
Leased and unleased	*	*	*	*	*	*	*	*	*	*
Unleased	*	*	*	*	*	*	*	*	*	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bowers Basin										
Leased and unleased	*	*	*	*	*	*	*	*	*	*
Unleased	*	*	*	*	*	*	*	*	*	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aleutian Arc										
Leased and unleased	*	*	*	*	*	*	*	*	*	*
Unleased	*	*	*	*	*	*	*	*	*	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St. George Basin										
Leased and unleased	0.17	0.39	0.91	0.00	0.00	0.00	0.02	0.01	0.00	0.01
Unleased	0.15	0.38	0.91	0.00	0.00	0.00	0.02	0.01	0.00	0.01
Leased	N/A	0.11	N/A	0.00	0.00	0.00	*	*	0.00	*
North Aleutian Basin										
Leased and unleased	0.17	0.61	2.08	0.00	0.00	0.00	0.02	0.01	0.00	0.01
Unleased	0.17	0.61	2.08	0.00	0.00	0.00	0.02	0.01	0.00	0.01
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2. *Estimates of undiscovered economically recoverable oil and gas resources in the Alaska OCS Region as of January 1987*—continued

	Conditional oil			Conditional gas						
Planning Area	**95% case**	**Mean case**	**5% case**	**95% case**	**Mean case**	**5% case**	**MP -HC (1)**	**Risked mean oil**	**Risked mean gas**	**Risked BOE(2)**
Gulf of Alaska Subregion:										
Shumagin										
Leased and unleased	0.12	0.28	0.57	0.00	0.00	0.00	0.01	*	0.00	*
Unleased	0.12	0.28	0.57	0.00	0.00	0.00	0.01	*	0.00	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kodiak										
Leased and unleased	0.11	0.43	0.95	0.00	0.00	0.00	0.03	0.01	0.00	0.01
Unleased	0.11	0.43	0.95	0.00	0.00	0.00	0.03	0.01	0.00	0.01
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulf of Alaska										
Leased and unleased	0.18	0.98	2.32	0.00	0.00	0.00	0.04	0.04	0.00	0.04
Unleased	0.18	0.98	2.32	0.00	0.00	0.00	0.04	0.04	0.00	0.04
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cook Inlet										
Leased and unleased	0.14	0.17	0.26	0.00	0.00	0.00	<0.01	*	0.00	*
Unleased	0.14	0.17	0.26	0.00	0.00	0.00	<0.01	*	0.00	*
Leased	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Alaska Region:										
Leased and Unleased	1.10	3.32	7.24	0.00	0.00	0.00	0.28	0.92	0.00	0.92

(1) The marginal probability of hydrocarbons. The probability that economically recoverable hydrocarbons exist in the area under study.

(2) Risked barrels of oil equivalent (BOE) in billions of BOE.

* Negligible.

N/A Not Available due to insufficient number of data points.

NOTE: Three categories of resources (unleased, leased, and total) required three separate PRESTO computer runs for each planning area (see U.S. DOI, 1989. "Estimates of Undiscovered Conventional Oil and Gas Resources in the United States--A Part of the Nation's Energy Endowment," 44 p.) In some cases, splitting prospects into leased and unleased caused portions to be subeconomic; therefore, adding the risked mean quantities for the unleased acreage to risked mean quantities for the leased acreage may not result in the risked mean quantities for the toal acreage. However, the total estimate was properly derived by running the PRESTO program for all prospects.

Table 3. *Estimated reserves of State of Alaska oil and gas fields as of January 1, 1990*

Area	Field	Oil Reserves (bbl)	Percent of Total Reserves	Percent Field Depleted	Gas Reserves* (mcf)	Percent of Total Reserves	Percent Field Depleted	Producing Formation
North Slope								
Proven and Developed								
(onshore/offshore)	Endicott	280,000,000	3.98%	23	782,000,000	2.47%	2	Endicott
	Kuparuk	885,000,000	12.57%	41	520,000,000	1.64%	23	Kuparuk River
	Lisburne	150,000,000	2.13%	26	888,000,000	2.80%	3	Lisburne
	Milne Point	50,000,000	0.71%	13	0	0.00%	0	Kuparuk River
	Prudhoe Bay Unit	4,700,000,000	66.77%	58	25,840,000,000	81.61%	4	Sadlerochit
Proven and Undeveloped or Shut-In								
(onshore/offshore)	Beaufort Sea	150,000,000	2.13%	0	0	0.00%	0	Sadlerochit
	West Sak	500,000,000	7.10%	0	0	0.00%	0	Cretaceous Sands
	Niakuk	50,000,000	0.71%	0	0	0.00%	0	Kuparuk River
	Point McIntyre	200,000,000	2.84%	0	0	0.00%	0	Kuparuk River
Subtotals		6,965,000,000	98.95%		28,030,000,000	88.53%		
Cook Inlet								
Proven and Developed								
(offshore)	Granite Point	16,000,000	0.23%	88	12,000,000	0.04%	89	Tyonek
	McArthur River	40,000,000	0.57%	93	589,000,000	1.86%	39	Tyonek
	Middle Ground Shoal	8,000,000	0.11%	95	5,000,000	0.02%	94	Tyonek
	North Cook Inlet	0	0.00%	0	686,000,000	2.17%	57	Sterling/Beluga
	Trading Bay	1,000,000	0.01%	99	30,000,000	0.09%	69	Tyonek
Proven and Undeveloped or Shut-In								
(onshore/offshore)	Nicolai Creek	0	0.00%	0	3,000,000	0.01%	26	Nicolai
Subtotals		65,000,000	0.92%		1,325,000,000	4.18%		
All Others								
(onshore)	15 Fields	9,000,000	0.13%		2,307,000,000	7.29%		
State Total		7,039,000,000			31,662,000,000			

*Note: Since no transportation system for natural gas exists on the North Slope, reserves are uneconomic at this time.

SOURCE: Alaska Department of Natural Resources, "Historical Projected Oil and Gas Consumption" January 1990.

2. Magnitude and Timing of Offshore Developments

The Secretary of the Interior has the statutory authority and responsibility to plan for and conduct the offering of leases for OCS acreage as directed in the OCS Lands Act (OCSLA), as amended in 1978 (43 U.S.C. 1331, et seq.). The Secretary delegated many of the pre- and postlease responsibilities under this authority to the Minerals Management Service (MMS). The procedures that MMS employs in administering each lease sale are depicted in figure 4 (p. 16).

July 1987 Final 5-Year OCS Oil and Gas Leasing Program

On July 2, 1987, the third 5-year program developed under section 18 of the OCSLA was given final approval by the Secretary of the Interior. This program, currently in effect, scheduled 12 sales in 10 of the 15 Alaska OCS planning areas between mid-1987 and mid-1992. The MMS periodically prepares a leasing milestone chart that projects tentative dates for the various steps for each of the OCS lease sales scheduled under the current 5-year program. The most recent revision of this milestone chart is dated April 1988 (see fig. 5, p. 17). For more information on the development of this and other 5-year programs, please refer to the previous *Alaska Update* or the *OCS National Compendium*. Copies are available free from the OCSIP at the address listed in the Preface of this document.

Draft Supplement to the Final EIS

Following approval of the July 1987 Five-Year Oil and Gas Leasing Program, petitioners filed suit in the U.S. Court of Appeals for the District of Columbia Circuit. Petitioners included the Natural Resources Defense Council; the States of California, Florida, Massachusetts, Oregon, and Washington; and various environmental groups. They challenged the Secretary of the Interior's OCS program on a variety of grounds, including alleged violations of the National Environmental Policy Act (NEPA), section 18 of the OCSLA, and section III of Public Law 99-591 (which imposed special procedures for considering leasing offshore California). The petitioners' cases were consolidated on January 29, 1988. The American Petroleum Institute, among others, intervened as respondents.

On October 30, 1988, the U.S. Court of Appeals for the District of Columbia found for the Department of the Interior (DOI) on all but one of the grounds on which the program was challenged. The court held that in the final environmental impact statement (EIS) the Secretary failed to perform an adequate analysis of the leasing program's potential cumulative impacts on migratory species. The court remanded that matter to the Secretary for further attention and for any revision to the 5-year program that the Secretary might deem necessary as a result of this new analysis.

To respond to the court's remand and to achieve the objectives outlined by the court, MMS prepared a supplemental EIS. This supplemental EIS analyzes only the cumulative impacts of OCS development on migratory species whose migration routes traverse more than one planning area in the Alaska and Pacific Regions. The analysis is based on the court's premise that the Secretary did not consider the effects of simultaneous interregional development on migratory species.

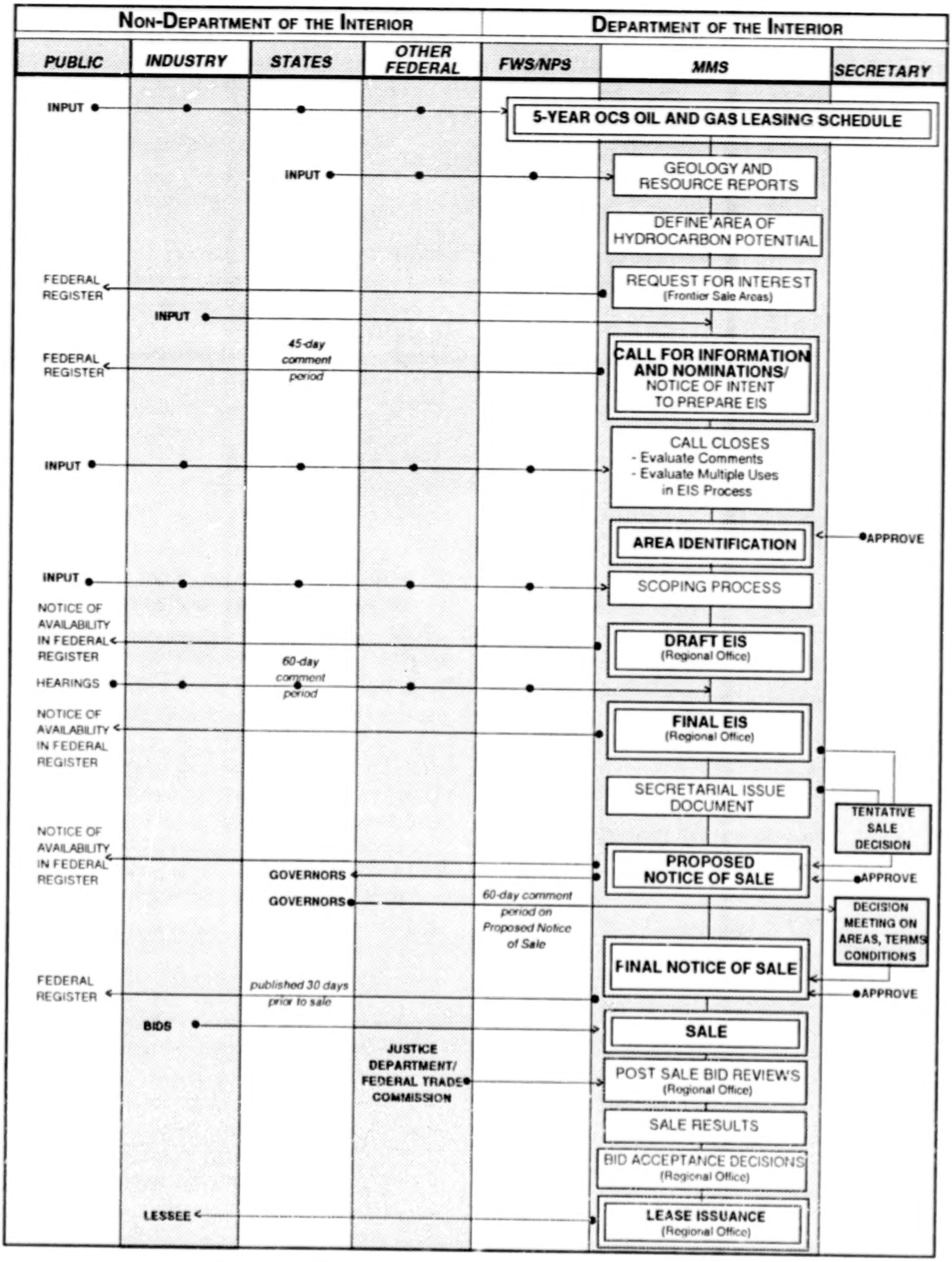
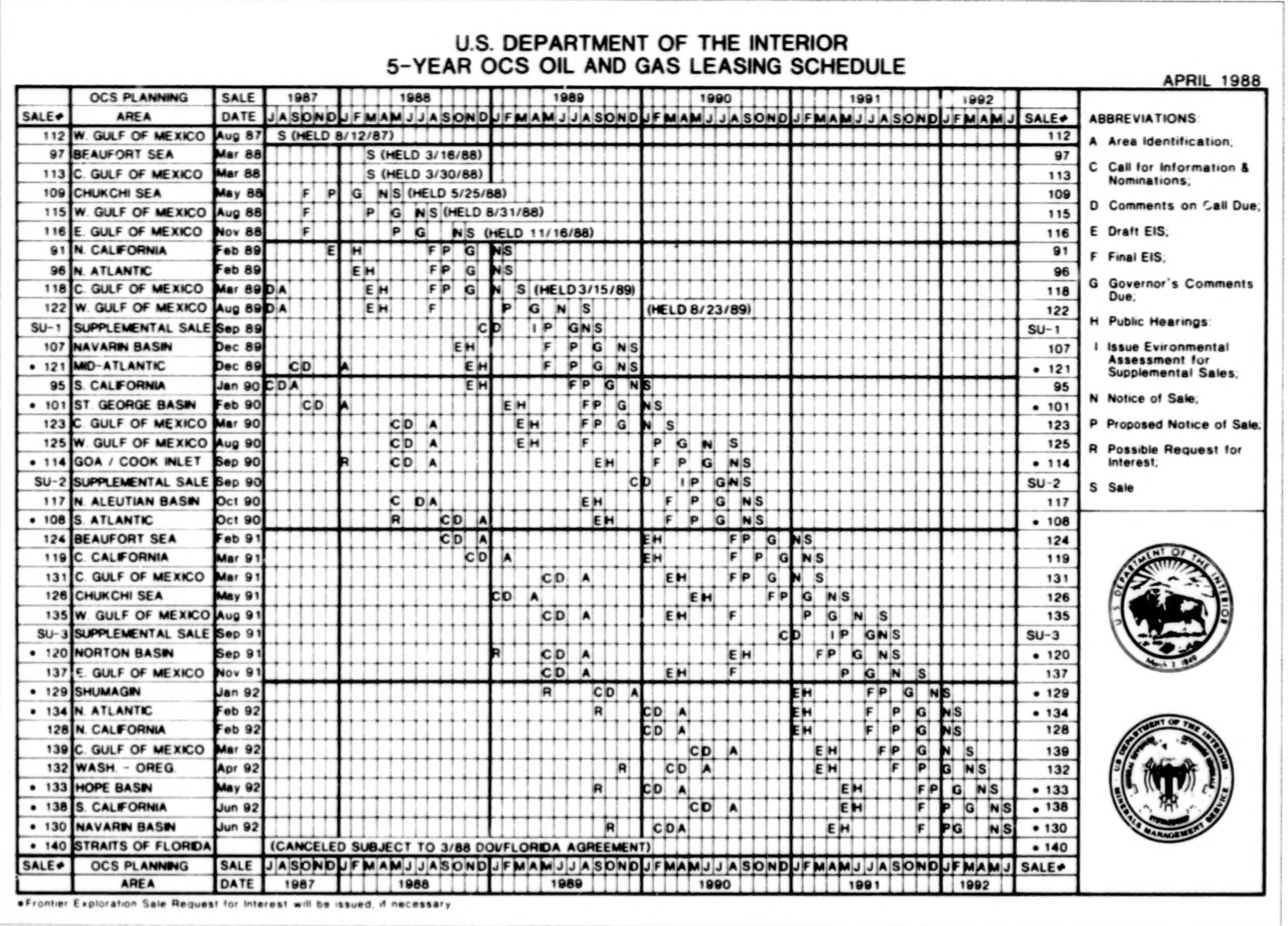

NON-DEPARTMENT OF THE INTERIOR
DEPARTMENT OF THE INTERIOR
PUBLIC
INDUSTRY
STATES
OTHER FEDERAL
FWS/NPS
MMS
SECRETARY
INPUT
5-YEAR OCS OIL AND GAS LEASING SCHEDULE
INPUT
GEOLOGY AND RESOURCE REPORTS
DEFINE AREA OF HYDROCARBON POTENTIAL
FEDERAL REGISTER
REQUEST FOR INTEREST (Frontier Sale Areas)
INPUT
FEDERAL REGISTER
45-day comment period
CALL FOR INFORMATION AND NOMINATIONS/ NOTICE OF INTENT TO PREPARE EIS
INPUT
CALL CLOSES - Evaluate Comments - Evaluate Multiple Uses in EIS Process
AREA IDENTIFICATION
APPROVE
INPUT
SCOPING PROCESS
NOTICE OF AVAILABILITY IN FEDERAL REGISTER
DRAFT EIS (Regional Office)
60-day comment period
HEARINGS
NOTICE OF AVAILABILITY IN FEDERAL REGISTER
FINAL EIS (Regional Office)
SECRETARIAL ISSUE DOCUMENT
TENTATIVE SALE DECISION
NOTICE OF AVAILABILITY IN FEDERAL REGISTER
GOVERNORS
PROPOSED NOTICE OF SALE
APPROVE
GOVERNORS
60-day comment period on Proposed Notice of Sale
DECISION MEETING ON AREAS, TERMS CONDITIONS
FINAL NOTICE OF SALE
FEDERAL REGISTER
published 30 days prior to sale
APPROVE
BIDS
SALE
JUSTICE DEPARTMENT/ FEDERAL TRADE COMMISSION
POST SALE BID REVIEWS (Regional Office)
SALE RESULTS
BID ACCEPTANCE DECISIONS (Regional Office)
LESSEE
LEASE ISSUANCE (Regional Office)

Figure 4. *The prelease phase of the OCS oil and gas leasing process.*



U.S. DEPARTMENT OF THE INTERIOR
5-YEAR OCS OIL AND GAS LEASING SCHEDULE

APRIL 1988

SALE#	OCS PLANNING AREA	SALE DATE	1987						1988											
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
112	W. GULF OF MEXICO	Aug 87		S (HELD 8/12/87)																
97	BEAUFORT SEA	Mar 88									S (HELD 3/16/88)									
113	C. GULF OF MEXICO	Mar 88									S (HELD 3/30/88)									
109	CHUKCHI SEA	May 88				F		P		G		N	S (HELD 5/25/88)							
115	W. GULF OF MEXICO	Aug 88				F					P		G		N	S (HELD 8/31/88)				
116	E. GULF OF MEXICO	Nov 88				F							P		G			N	S (HELD 11/16/88)	
91	N. CALIFORNIA	Feb 89						E		H						F	P		G	
96	N. ATLANTIC	Feb 89								E	H					F	P		G	
118	C. GULF OF MEXICO	Mar 89	D	A							E	H				F	P		G	
122	W. GULF OF MEXICO	Aug 89	D	A							E	H				F				
SU-1	SUPPLEMENTAL SALE	Sep 89																		C
107	NAVARIN BASIN	Dec 89																E	H	
• 121	MID-ATLANTIC	Dec 89			C	D			A										E	H
95	S. CALIFORNIA	Jan 90	C	D	A														E	H
• 101	ST. GEORGE BASIN	Feb 90				C	D		A											
123	C. GULF OF MEXICO	Mar 90											C	D		A				
125	W. GULF OF MEXICO	Aug 90											C	D		A				
• 114	GOA / COOK INLET	Sep 90							R				C	D		A				
SU-2	SUPPLEMENTAL SALE	Sep 90																		
117	N. ALEUTIAN BASIN	Oct 90											C		D	A				
• 108	S. ATLANTIC	Oct 90											R				C	D		A
124	BEAUFORT SEA	Feb 91															C	D		A
119	C. CALIFORNIA	Mar 91																	C	D
131	C. GULF OF MEXICO	Mar 91																		
126	CHUKCHI SEA	May 91																		
135	W. GULF OF MEXICO	Aug 91																		
SU-3	SUPPLEMENTAL SALE	Sep 91																		
• 120	NORTON BASIN	Sep 91																		
137	E. GULF OF MEXICO	Nov 91																		
• 129	SHUMAGIN	Jan 92																		
• 134	N. ATLANTIC	Feb 92																		
128	N. CALIFORNIA	Feb 92																		
139	C. GULF OF MEXICO	Mar 92																		
132	WASH. - OREG.	Apr 92																		
• 133	HOPE BASIN	May 92																		
• 138	S. CALIFORNIA	Jun 92																		
• 130	NAVARIN BASIN	Jun 92																		
• 140	STRAITS OF FLORIDA		(CANCELED SUBJECT TO 3/88 DOI/FLORIDA AGREEMENT)																	

SALE#	1989												1990											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
112																								
97																								
113																								
109																								
115																								
116																								
91	N	S																						
96	N	S																						
118	N		S (HELD3/15/89)																					
122		P		G		N		S					(HELD 8/23/89)											
SU-1	D			I	P		G	N	S															
107					F		P		G		N	S												
• 121					F		P		G		N	S												
95							F	P		G		N	S											
• 101		E	H					F	P		G		N	S										
123			E	H				F	P		G		N		S									
125			E	H				F						P		G		N		S				
• 114									E	H				F		P		G		N	S			
SU-2												C	D			I	P		G	N	S			
117								E	H						F		P		G		N	S		
• 108									E	H					F		P		G		N	S		
124													E	H						F	P		G	
119		A											E	H						F		P		G
131					C	D		A							E	H				F	P		G	
126	C	D		A													E	H					F	P
135					C	D		A							E	H				F				
SU-3																								C
• 120	R				C	D		A												E	H			
137					C	D		A							E	H				F				
• 129					R				C	D		A												
• 134									R				C	D		A								
128													C	D		A								
139																	C	D		A				
132											R				C	D		A						
• 133									R				C	D		A								
• 138																	C	D		A				
• 130										R				C	D	A								
• 140																								

SALE#	1991												1992						SALE#
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	
112																			112
97																			97
113																			113
109																			109
115																			115
116																			116
91																			91
96																			96
118																			118
122																			122
SU-1																			SU-1
107																			107
• 121																			• 121
95																			95
• 101																			• 101
123																			123
125																			125
• 114																			• 114
SU-2																			SU-2
117																			117
• 108																			• 108
124	N	S																	124
119		N	S																119
131	N		S																131
126		G		N	S														126
135		P		G		N		S											135
SU-3	D			I	P		G	N	S										SU-3
• 120			F	P		G		N	S										• 120
137					P		G		N		S								137
• 129	E	H					F	P		G		N	S						• 129
• 134	E	H					F		P		G		N	S					• 134
128	E	H					F		P		G		N	S					128
139			E	H				F	P		G		N		S				139
132			E	H					F		P		G		N	S			132
• 133					E	H					F	P		G		N	S		• 133
• 138					E	H					F		P		G		N	S	• 138
• 130				E	H						F		P	G			N	S	• 130
• 140																			• 140

•Frontier Exploration Sale Request for Interest will be issued, if necessary

ABBREVIATIONS:

A	Area Identification;
C	Call for Information & Nominations;
D	Comments on Call Due;
E	Draft EIS;
F	Final EIS;
G	Governor's Comments Due;
H	Public Hearings;
I	Issue Evironmental Assessment for Supplemental Sales;
N	Notice of Sale;
P	Proposed Notice of Sale;
R	Possible Request for Interest;
S	Sale

March 3, 1849

MINERALS MANAGEMENT SERVICE

Figure 5. *July 1987 Final 5-Year OCS Oil and Gas Leasing Program milestones chart.*

On August 24, 1989, MMS published in the *Federal Register* (54 FR 35256) a Notice of Availability of the draft supplemental EIS to the final EIS for the Proposed 5-Year OCS Oil and Gas Leasing Program for Mid-1987 to Mid-1992. One week later, on August 31, 1989, the MMS announced in the *Federal Register* (54 FR 36061) that public hearings would be held the last week in September 1989 in the States of Alaska, California, and Oregon. Comments resulting from reviews of the draft supplemental EIS and written materials prepared as part of testimony at the public hearings were due to MMS on or before October 17, 1989.

Following the review of the public hearing testimony and written comments submitted to MMS on the draft supplemental EIS, a final supplemental EIS will be prepared. This final supplemental EIS is scheduled to be completed in February 1990. For further information on or for copies of the draft supplemental EIS, please contact the Regional Director, Alaska OCS Region, at the following address and telephone number:

Minerals Management Service
949 East 36th Ave.
Anchorage, Alaska 99508-4302
(907) 261-4070

Federal OCS Oil and Gas Leasing in the Alaska OCS Region

The first lease sale for OCS acreage offshore Alaska was held in 1976. Since that time a total of 15 sales have been held. The DOI has leased 1,481 blocks or bidding units (8.2 million acres) and has received over $6.4 billion in high bonus bids. Most of these sales were held under the auspices of previous 5-year OCS oil and gas leasing schedules. Of the 12 sales scheduled under the current July 1987 Final 5-Year Program, 2 have occurred: Lease Sale 97 (Beaufort Sea) was held on March 16, 1988, and Lease Sale 109 (Chukchi Sea) was held on May 25, 1988. Bids for one lease sale, OCS Lease Sale 92, originally held January 13, 1986, were opened during the period of this report (see discussion that follows for more information). Seventeen bids submitted by four oil companies for blocks offered in April 1984 (OCS Lease Sale 83, Navarin Basin) were returned in December 1988. The MMS returned $30.3 million (the one-fifth bonus submitted at the lease sale, plus interest) to four of the oil companies that bid at the sale. The 17 bids affected by the Soviet claim of jurisdiction to the area were rejected, since the Secretary of the Interior concluded it was no longer in the best interest of the United States to retain bids.

Specific information on each of the Alaska OCS lease sales is presented in table 4 (p. 19). As of January 1, 1990, there were 930 active leases owned by 36 offshore operators. Figure 6 (p. 20) shows the top 10 Alaska OCS leaseholders by percentages of acreage held.

The MMS, Alaska OCS Region, developed a chart that graphically depicts the stipulations that have been used for oil and gas lease sales in the Alaska OCS Region. The chart is categorized into the Gulf of Alaska/Cook Inlet Region, the Bering Sea Region, and the Arctic Region (see fig. 7). The wording of the stipulations are in the Notice of Sale for each of the sales listed in table 4. A narrative publication that will include the wording is forthcoming and will be distributed as soon as it is available. The chart comes in two sizes: 19 x 15 inches or 4 x 3 feet. For further information on or for copies of the chart, contact the MMS at the following address and phone number.

Minerals Management Service
949 East 36th Ave., Room 110
Anchorage, Alaska 99508-4302
(907) 261-4438.

Table 4. *Lease sale history of the Alaska OCS Region as of January 1, 1990*

Planning Area	Lease Sale	Date Held (Proposed)	Blocks Offered	Acres Offered	Leases Issued	Acres Leased	Wells Drilled	OCS Order No.4	Existing Leases	Existing Acreage
ARCTIC										
DIAPIR FIELD	71	10/13/82	338	1,825,770	121	662,860	7	2**	71	398,445
	87	08/22/84	1,419	7,773,447	227	1,207,714	6	1**	211	1,131,351
BEAUFORT SEA	BF	12/11/79	46	173,423	24	85,776	8	5**	14	47,799
	97	03/16/88	3,344	18,277,806	202	1,110,764			202	1,110,912
	124	(02/91)								
BARROW ARCH	85	CANCELED (03/09/84)								
CHUKCHI SEA	109	05/25/88	4,694	25,531,122	339	1,914,285	3 #		350	1,976,872
	126	(05/91)								
HOPE BASIN	133 *	(05/92)								
BERING SEA										
NORTON	57	03/15/83	418	2,379,751	59	335,898	6		6	34,159
	100	CANCELED (04/07/86)								
	120 *	(09/91)								
NAVARIN	83	04/17/84	5,036	28,048,995	163	927,989	8		23	130,945
	107	****								
	130 *	(06/92)								
ST. GEORGE	70	04/12/83	479	2,688,787	96	540,917	10		30	170,798
	89	CANCELED (05/02/86)								
	101 *	****								
NORTH ALEUTIAN	92	ENJOINED (10/11/88)	990	5,603,472	23	121,754			23	121,756
	117	(10/90)								
GULF OF ALASKA										
COOK INLET	CI	10/27/77	135	768,580	87	495,307	10		0	0
	60	09/29/81	153	858,247	13	73,157	3		0	0
	RS2	08/05/82	140	785,091	0	0	0		0	0
	136	Combined with 114 - to be held on 09/90								
GULF OF ALASKA	39	04/13/76	189	1,008,499	76	409,058	11			
	55	10/21/80	210	1,195,569	35	199,261	1			
	RS1	06/30/81	175	996,300	1	5,693				
	88	CANCELED (05/02/86)								
[GULF OF ALASKA/ COOK INLET]	114 *	(09/90)								
SHUMAGIN	86	CANCELED (02/26/86)								
	129 *	(01/92)								
KODIAK	127	CANCELED (04/27/87)								
SUPPLEMENTAL SALES* **	SU-1	(09/89)								
	SU-2	(09/90)								
	SU-3	(09/91)								
TOTAL			17,766	97,914,859	1,466	8,090,433	73	8**	930	5,123,037

* - Designated as Frontier Exploration Sales whose occurrence depends upon industry interest.
** - Wells determined producible under OCS Order No. 4.
*** - Supplemental sales may or may not contain OCS acreage offshore Alaska.
****- Contact Chief, Offshore Leasing Management Division, (202) 343-6906 for more information.
# - Includes two wells temporarily abandoned for the winter.

NOTE: The data in this table do not cover 17 blocks bid upon in Lease Sale 83, 4 blocks bid upon under Lease Sale 87, nor 16 blocks bid upon in Lease Sale 97. These blocks lie in areas subject to jurisdictional disputes with foreign nations, or with the State of Alaska, and no leases have been issued.

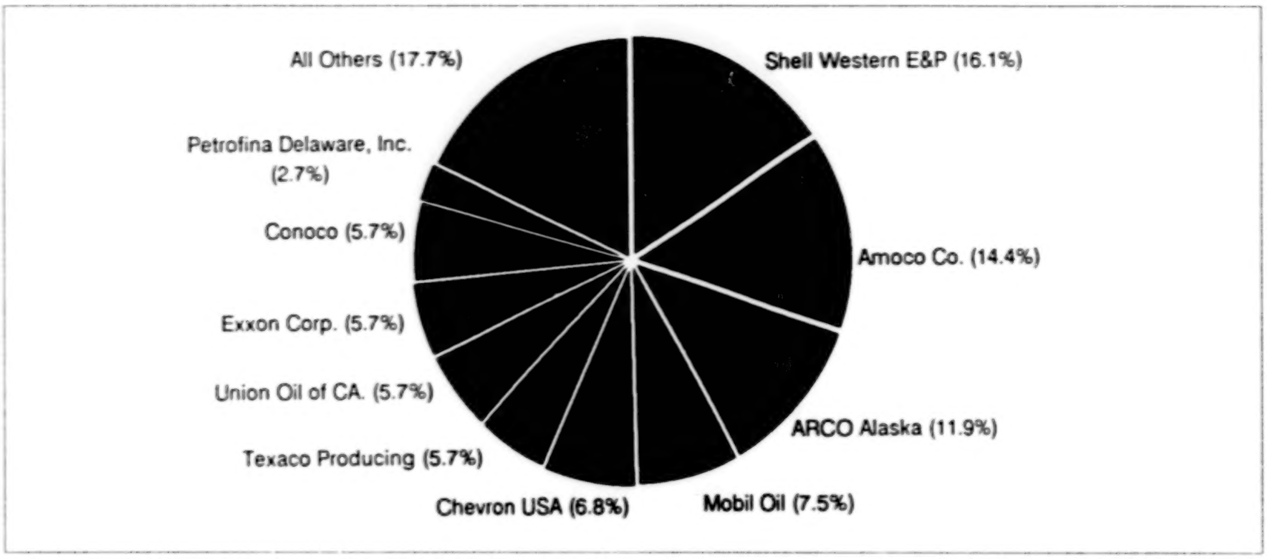


Figure 6. *Top 10 Alaska OCS leaseholders by percentages of acreage held, January 1990*

OCS Lease Sale 92 (North Aleutian Basin)

OCS Lease Sale 92 was the third Federal OCS lease sale planned for the North Aleutian Basin Planning Area. Sale 51 in the Outer Bristol Basin and Sale 75 in the North Aleutian Shelf, scheduled for December 1977 and October 1983, respectively, were dropped from previous DOI leasing schedules.

On December 27, 1985, the U.S. District Court for the District of Alaska consolidated three separate lawsuits against DOI that focused on Sale 92 (*Tribal Village of Akutan et al.* v. *Donald P. Hodel et al.*; Civ. No. A85-701 (consolidated)). On January 13, 1986, the District Court issued an order granting the plaintiffs a preliminary injunction that prevented DOI from receiving, opening, or accepting bids on or otherwise conducting Sale 92. On January 17, 1986, the U.S. Ninth Circuit Court of Appeals granted the Federal defendant's request for an expedited action. The Circuit Court on April 28, 1986, upheld the District Court ruling and affirmed the issuance of the preliminary injunction. The Circuit Court ruling concluded that the hearing and notice procedures of section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) of 1980, as amended, (16 U.S.C. 3120) would need to be correctly followed before the DOI could hold the sale. The Federal Government filed a petition with the U.S. Supreme Court (No. 86-303) to review the Circuit Court decision on August 26, 1986, but requested that the petition be held until the Court ruled on the *Hodel* v. *Gambell* (No. 85-1406) (Gambell II) case, a related suit that also focuses on the applicability of section 810 to OCS lease sales.

On March 24, 1987, the U.S. Supreme Court ruled that ANILCA does not apply to the OCS, thereby remanding the case to the District Court. The Federal court subsequently ruled in DOI's favor on three other issues in the case, concluding that DOI complied with the OCS Lands Act, the Endangered Species Act, and the National Environmental Policy Act. The injunction was lifted by the court on March 11, 1988, but was reinstated pending appeal of its decision by the plaintiffs to the Ninth Circuit Court of Appeals in San Francisco. On October 5, 1988, the Appeals Court ruled in favor of DOI on all counts. Following the

Stipulations	REGIONS																							
	Gulf/Cook Inlet Sales								Bering Sea Sales									Arctic Sales						
	39	CI	55	RS-1	60	RS-2	114	129	57	70	83	92	101	107	117	120	130	BF	71	87	97	109	124	126	133
Agreement Regarding Section 7																		X	X	X					
Agreement Regarding Unitization																		X	X	X					
Density Restriction-Noise																						X			
Discharges (NPDES)									X									X	X	X					
Drilling Below Threshold Depth Restricted									X		X								X						
Geologic Hazards (Slumping)	X																								
Industry Site-Specific Monitoring																					X	X			
No Operations/Structures-Disputed Blocks																		X							
No Production Platforms w/4 mi. of Coast	X																								
Notice of Support Activity	X	X																							
Offshore Loading Prohibition									X	X		**													
Oil Spill Clean Up Capability	*																			X					
Oil Response Preparedness/Testing												X									X	X			
Orientation Program		X	X	X	X	X			X	X	X	X						X	X	X	X	X			
Profit Share in Amount/Production				X	X	X																			
Protection of Biological Resources	*	X			X	X				X	X	X						X	X	X	X	X			
Protection of Commercial Fisheries	*											X													
Protection of Archaeological Resources	*X	X	X	X	X	X			X	X	X	X						X	X	X	X	X			
Protection of Endangered Whales/Seismic Activities												X													
Protection of Seabirds/Marine Mammals	*	X																							
Restoration of Site																		X							
Royalty Rate Reduction Provision		X	X	X					X	X								X	X						
Seasonal Drilling Restriction									X									X	X	X					
Soild Waste Disposal Prohibited																		X							
Subsistence Activities																					X	X			
Transportation of Hydrocarbons (Pipelines)		X	X	X	X	X			X	X		X						X	X	X	X	X			
Underwater Blasting Restriction		X	X	X																					
Unit Agreement May Be Required		X																							
Wellhead/Pipeline Protection			X	X	X	X				X	X	X													

* The protection of archaeological resources stipulation, as it was included in the Sale 39 leases, covered not only archaeological resources, but also addressed placement of structures to minimize interference with other signficant uses of the OCS (including commercial fishing, marine mammals, and bird rookeries), pollution containment and removal, and contained a paragraph much like the protection of biological resources stipulation.

** Included in transportation of hydrocarbons stipulation.

SOURCE: Reproduced from wall chart developed by Alaska OCS Region.

Figure 7. *Alaska OCS Region lease sale stipulations.*

ruling, the State and other groups filed an appeal to the U.S. Supreme Court. Justice Sandra Day O'Connor refused without comment to stay the sale, and on October 11, 1988, MMS held OCS Lease Sale 92, receiving 23 bids on 23 tracts and accepting over $95 million in high bonus bids.

Following the *Exxon Valdez* oil spill in Prince William Sound (see app. A for more information), the State of Alaska, environmental groups, and fishing organizations opposed to drilling in Bristol Bay redirected their protests toward Congress. Congress responded to their requests by prohibiting the DOI from appropriating funds for the conduct of leasing, or the approving or permitting of any drilling or other exploration activity on OCS lands within the North Aleutian Basin Planning Area for fiscal year 1990 (October 1, 1989, through September 30, 1990). As part of the fiscal year 1990, DOI appropriations bill (P.L. 101-121), the DOI was required to address concerns related to oil and gas exploration in the North Aleutian Basin and report back to Congress by March 1, 1991.

First, the Fish & Wildlife Service (FWS) is to conduct a study of the effect of the *Exxon Valdez* oil spill on Prince William Sound fisheries and address applicability of its findings to reasonable threats to Bristol Bay fisheries, if OCS exploration were to occur.

Second, the Secretary of the Interior is to determine if (1) OCS oil-spill contingency plans for the North Aleutian Basin are acceptable and based on best available technology, (2) personnel and equipment are in place to implement those plans, and (3) technology and personnel can contain a maximum volume spill.

Third, the Secretary is directed to examine the possible repurchase of existing leases in the area. As part of this examination, and using the results of the abovementioned FWS study, the Secretary is to (1) assess the impacts of the possible repurchase and (2) recommend whether a repurchase option should be exercised.

OCS Lease Sales Scheduled for the Alaska OCS Region

Ten OCS lease sales remain scheduled under the July 1987 Final 5-Year OCS Oil and Gas Leasing Program for the OCS adjacent to Alaska. Figure 5 (p. 17) lists the remaining prelease steps for each of the sales scheduled under the current 5-year program. Table 5 on the next page presents public notices for prelease steps that have already occurred for these sales.

OCS Mining Program, Norton Sound Lease Sale

In addition to the 10 remaining oil and gas lease sales scheduled for the Alaska OCS, the MMS OCS Mining Program has scheduled a sale in Alaska's Norton Sound. (See ch. 1 and the previous *Alaska Update* for additional information on this sale.)

On November 16, 1987, Governor Cowper requested that MMS join with the State of Alaska to evaluate the feasibility of developing mineral resources in waters adjacent to Alaska. A cooperative agreement was signed by the Secretary of the Interior on February 5, 1988, and a Federal-State coordination team was established. The team consists of 31 members to share information and expertise and to consult with DOI, through MMS, regarding decisions about the OCS Mining Program, Norton Sound Lease Sale.

As a result of Westgold's ongoing gold dredging under a State lease offshore of Nome and expression of industry interest, a Request for Comments and Nominations and Notice of Intent to Prepare an EIS was published in the *Federal Register* (53 FR 8134) on March 11, 1988. The Request for Comments covered 77 blocks totaling approximately 350,000 acres. An Area Identification for the Norton Sound Lease Sale was

Table 5. *Dates of and* Federal Register *notices for significant prelease steps for proposed Alaska OCS lease sales from January 1987 through January 1990*

Lease Sale number/area	PRE-STEP Request for Interest	Prelease steps (1)						
		C	**A**	**E**	**F**	**P**	**N**	**S**
SU-1, Supplemental Sales#								Proposed 09/89+
107, Navarin Basin		04/24/84 49 FR 17686 04/28/86*** 51 FR 15851	07/27/84					Proposed 12/89+
101, St. George Basin	06/19/87 52 FR 23418	10/08/87 52 FR 37756	02/02/88					Proposed 02/90
114, Gulf of Alaska	10/31/85 50 FR 45574 01/26/88 53 FR 2208**	05/18/88 53 FR 17902	09/01/88					Proposed 09/90
117, North Aleutian Basin								Proposed 10/90
124, Beaufort Sea		09/14/88 53 FR 35632	12/23/88					Proposed 02/91
126, Chukchi Sea		01/13/89 54 FR 1633	05/09/89					Proposed 05/91
120, Norton Basin	04/30/87 52 FR 15932 05/15/87 52 FR 18495* 01/13/89 54 FR 1627							Proposed 09/91
129, Shumagin	06/13/89 54 FR 25218							Proposed 01/92
133, Hope Basin								Proposed 05/92
130, Navarin Basin								Proposed 06/92

(1) Prelease steps are abbreviated for brevity in this table as follows.
C = Call for Information & Nominations & Notice of Intent to Prepare an E.I.S
A = Area Identification/Tentative Tract Selection (Public Announcement)
E = Draft EIS (Notice of Availability)
F = Final EIS (Notice of Availability)
P = Proposed Notice of Sale (Notice of Availability)
N = Notice of Sale
S = Sale

* Correction
** Date change
*** Request for supplemental information
# Supplemental sales may or may not contain OCS acreage offshore Alaska.
+ Contact Chief, Offshore Leasing Management Division, (202) 343-6906 for more information.

made in May 1988 following a review of the nominations. The area identified consists of 40 blocks for a total of 178,282.50 acres.

On November 29, 1988, MMS released the draft EIS for the proposed sale. The draft EIS describes a proposal for marine minerals leasing in two areas of the OCS: south of the city of Nome, Alaska, and southeast of Safety Sound. (See ch. 1 for more information on the location of the sale). The MMS estimates that placer deposits of gold could range from 0.5 million to more than 1 million troy ounces.

Coinciding with the release of the draft EIS, a workshop was held in Anchorage, Alaska, on "Mercury in the Marine Environment." (See the "Additional Readings" section at the end of this chapter for more information). The objective of the workshop was to review current knowledge of mercury levels in seawater, sediments, and organisms, and to discuss related water-quality criteria and health concerns. The results provided MMS with additional information for preparation of the final EIS.

A public hearing was held in Nome, Alaska, on January 5, 1989, and the written comment period for the draft EIS closed January 17, 1989. In response to public health concerns, appropriate sections of the EIS were provided in April 1989 to the Food and Drug Administration, the Center for Disease Control, the Public Health Service, and the Alaska Native Health Service for their review. Comments from these organizations were included in a draft final EIS. A new draft EIS is planned owing to the (1) availability of new information from water-column studies conducted in May and September 1989, (2) the first phase of a public health study scheduled for October 1989, and (3) a November 1989 workshop to discuss results of the studies.

In December 1989, it was decided to delete 6 blocks from the proposal because of their apparent importance as red king crab habitat. The area being considered in the proposal was reduced from 40 to 34 whole and partial blocks (approximately 147,050 acres) (see fig. 3, ch. 1, p. 7).

Development of the 5-Year OCS Oil and Gas Leasing Program, Fall 1991 to Fall 1996

On July 14, 1989, the MMS published a Notice of Request for Comments on the development of a new 5-Year OCS Oil and Gas Leasing Program in the *Federal Register* (54 FR 29833). As stated in section 18 of the OCSLA, the DOI is required to solicit suggestions from Federal agencies, coastal States, and others during the preparation of a new 5-year OCS oil and gas leasing program. The current leasing program, approved in July 1987, scheduled lease sales through June 1992. The July 14, 1989, *Federal Register* notice announced that MMS intends to prepare a new program for the period fall 1991 to fall 1996.

Statutorily required steps in the program development process, following the initial Notice of Request for Comments, include the development of a draft proposed program, a proposed program, a proposed final program, and a final program. An EIS will also be prepared. Initiation of the EIS process was announced in the *Federal Register* on July 14, 1989 (54 FR 29832).

The program preparation effort is expected to take over 2 years to complete. Approval of the new program in fall 1991 will help provide a smooth transition from the existing program to the new one. The draft proposed program is currently scheduled to be issued in mid-1990.

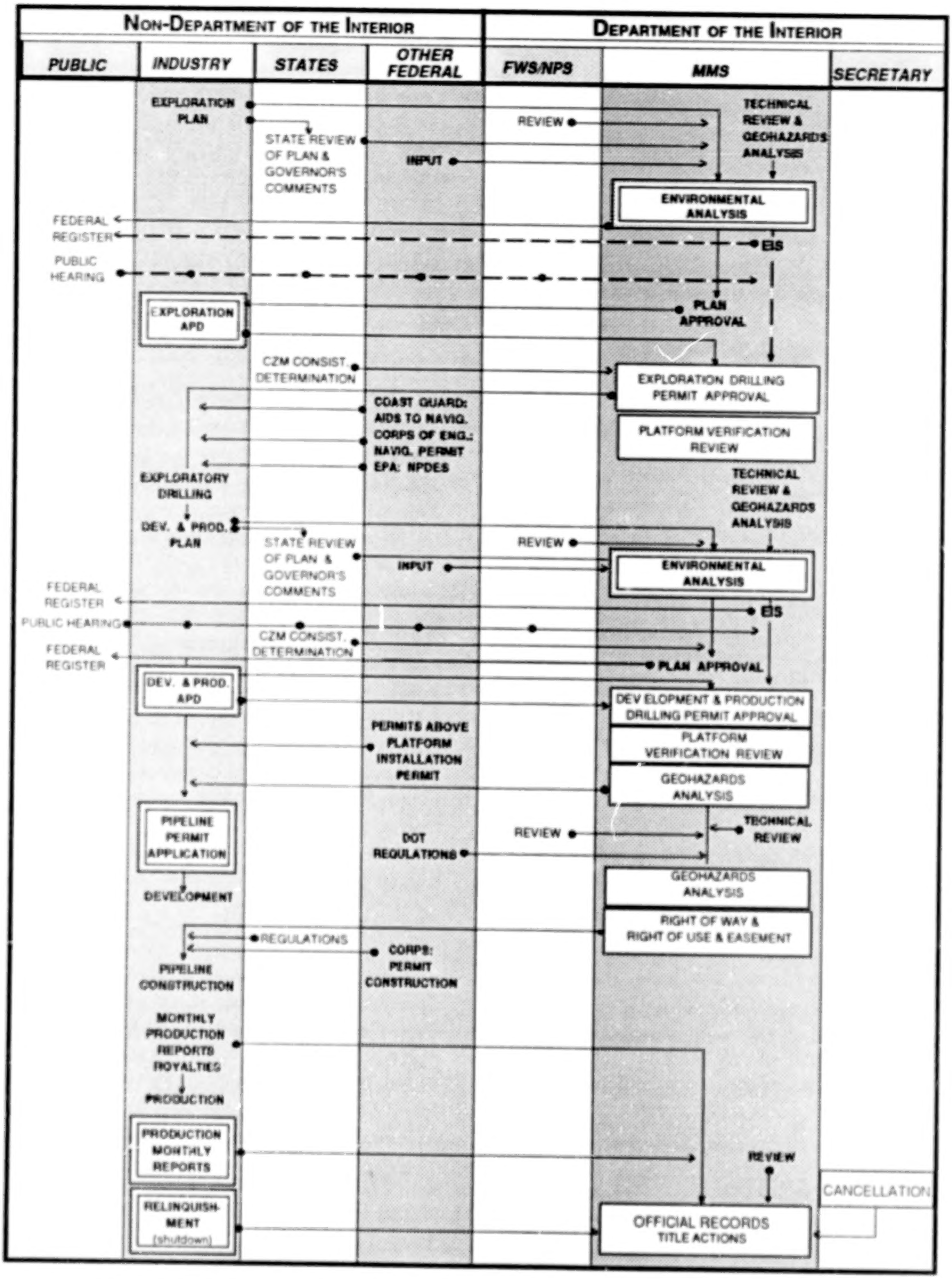

NON-DEPARTMENT OF THE INTERIOR
DEPARTMENT OF THE INTERIOR
PUBLIC
INDUSTRY
STATES
OTHER FEDERAL
FWS/NPS
MMS
SECRETARY
EXPLORATION PLAN
TECHNICAL REVIEW & GEOHAZARDS ANALYSIS
REVIEW
STATE REVIEW OF PLAN & GOVERNOR'S COMMENTS
INPUT
ENVIRONMENTAL ANALYSIS
FEDERAL REGISTER
EIS
PUBLIC HEARING
EXPLORATION APD
PLAN APPROVAL
CZM CONSIST. DETERMINATION
EXPLORATION DRILLING PERMIT APPROVAL
COAST GUARD: AIDS TO NAVIG.
CORPS OF ENG.: NAVIG. PERMIT
EPA: NPDES
PLATFORM VERIFICATION REVIEW
EXPLORATORY DRILLING
TECHNICAL REVIEW & GEOHAZARDS ANALYSIS
DEV. & PROD. PLAN
STATE REVIEW OF PLAN & GOVERNOR'S COMMENTS
REVIEW
INPUT
ENVIRONMENTAL ANALYSIS
FEDERAL REGISTER
EIS
PUBLIC HEARING
CZM CONSIST. DETERMINATION
FEDERAL REGISTER
PLAN APPROVAL
DEV. & PROD. APD
DEVELOPMENT & PRODUCTION DRILLING PERMIT APPROVAL
PERMITS ABOVE PLATFORM INSTALLATION PERMIT
PLATFORM VERIFICATION REVIEW
GEOHAZARDS ANALYSIS
PIPELINE PERMIT APPLICATION
REVIEW
TECHNICAL REVIEW
DOT REGULATIONS
DEVELOPMENT
GEOHAZARDS ANALYSIS
RIGHT OF WAY & RIGHT OF USE & EASEMENT
REGULATIONS
CORPS: PERMIT CONSTRUCTION
PIPELINE CONSTRUCTION
MONTHLY PRODUCTION REPORTS ROYALTIES
PRODUCTION
PRODUCTION MONTHLY REPORTS
REVIEW
CANCELLATION
RELINQUISHMENT (shutdown)
OFFICIAL RECORDS TITLE ACTIONS

Figure 8. *The postlease phase of the OCS oil and gas leasing process.*

Postlease Developments on the Alaska OCS

The procedures employed by MMS in reviewing and administering OCS postlease activities is presented in figure 8 (p. 25). All postlease activity stemming from OCS lease sales in the Alaska OCS Region during the period of this report have been exploratory in nature. Four exploratory wells were drilled in the Alaska OCS Region during this time—one in the Beaufort Sea and three (two of which were temporarily abandoned) in the Chukchi Sea planning areas. More information on these prospects is presented below. Table 6 provides a listing of the wells drilled on the Alaska OCS through December 31, 1989. In addition to this report, the OCSIP has prepared a series of map plates for four of the Alaska OCS Region planning areas. The maps depict the location of the prospects listed below, as well as the location of the wells drilled in each of these planning areas.

Beaufort Sea Planning Area

Belcher Prospect

As reported in the previous *Alaska Update*, Amoco received approval for its exploration plan that covered three OCS leases issued in OCS Lease Sale 87 (OCS Y-917, 918, and 926) in the eastern Beaufort Sea. Amoco spudded the well on September 6, 1988, on lease OCS Y-917, block 724. The well was drilled by Beaudril's *Kulluk*, a semisubmersible rig designed to withstand arctic sea ice. The well, located approximately 52 miles northeast of Kaktovik, was drilled in approximately 167 feet of water. The well was temporarily plugged and abandoned on October 26, 1988. The well was reentered on August 2, 1989, again using the *Kulluk*. It was finally plugged on August 29, 1989.

Galahad Prospect

The Galahad Prospect is made up of 12 leases acquired by Amoco, Shell, and Unocal at OCS Lease Sale 97, held March 16, 1988. Amoco, the operator of the leases, filed an exploration plan (EP) to drill a well on lease OCS Y-1092, Block 412. The proposed well site is located in the Beaufort Sea approximately 44 miles northeast of the KIC (Kaktovik Inupiat Corporation) No. 1 well drilled by Chevron USA on the Arctic Slope Regional Corporation acreage in the Arctic National Wildlife Refuge in 1987.

Amoco's EP was approved by MMS; however, on March 6, 1989, Alaska denied consistency for Amoco's Galahad Prospect EP citing noncompliance with the State's seasonal drilling restriction (SDR) policy and the need for additional bowhead whale monitoring requirements. OCS Lease Sale 97 was the first Beaufort Sea lease sale that did not contain an SDR stipulation prohibiting drilling during the bowhead whale migration period. This is due in part to the National Marine Fishery Service's biological opinion for Sale 97, which found that the proposed OCS oil and gas leasing and subsequent exploration activities would not likely jeopardize the continued existence of the bowhead whales or result in the destruction or adverse modification of their critical habitat.

On April 3, 1989, Amoco filed an appeal with the U.S. Commerce Secretary over the decision by the State not to issue a favorable finding on its Galahad Prospect. The DOI and MMS submitted comments supporting the applicant to the Department of Commerce (DOC) on June 12, 1989, and July 12, 1989, respectively. Comments reflected the belief that the State of Alaska (1) did not present a valid consistency objection, (2) used policies that have not been approved by DOC, and (3) failed to provide Amoco with reasonable available alternatives that would permit the activity to be conducted in a manner consistent with the coas-

Table 6. *Alaska OCS drilling history as of January 1,1990*

Sale	Prospect/ Unit name	Block	OPD No.	Lease No.	Operator	Rig	Well No.	Water Depth	Spud Date	P&A Date	Total Depth
GULF OF ALASKA											
	COST No. 1	196#	NO 7-1		ARCO	Glomar Conception		570	07-22-75	10-09-75	5,150
	KSST No. 1	573	NO 5-8		ESCI	Zapata Trader		162	07-13-76	08-01-76	4,225
	KSST No. 2	384	NO 5-6		ESCI	Zapata Trader		232	08-04-76	08-23-76	4,307
	KSST No. 4	781	NO 5-4		ESCI	Zapata Trader		307	08-28-76	09-19-76	1,391
39	Maria	106		0011	SHELL	Sedco 706	1	541	09-01-76	01-28-77	13,565
39	Salome	72		0007	ARCO	Ocean Ranger	1	250	10-21-76	06-03-77	17,920
39	Yvonne	111		0014	SHELL	Sedco 706	1	405	02-11-77	06-19-77	13,598
39							1 ST	485	06-20-77	09-12-77	15,390
39	Setter	284		[illegible]	EXXON	Alaskan Star	1	585	03-08-77	07-08-77	12,995
39	Cape Suckling	241		[illegible]	TEXACO	Ocean Bounty	1	599	04-15-77	07-15-77	15,031
39	Walrus	329		0059	GULF	Aleutian Key	1	623	05-13-77	08-16-77	12,170
	KSSD No. 1	999			SUN	Sedco 708		600	05-25-77	07-17-77	8,517
39	Raccoon	343	NO 6-2	0080	EXXON	Alaskan Star	1	448	07-09-77	01-04-78	13,507
39	Yakataga	162	NO 7-1	0032	TEXACO	Ocean Bounty	1	234	07-17-77	02-20-78	15,638
	KSSD No. 2	463	NO 6-3		SUN	Sedco 708		400	07-22-77	09-08-77	10,460
	KSSD No. 3	14	NO 5-8		SUN	Sedco 708		280	09-13-77	10-25-77	9,355
39	Marmot	414	NO 7-1	0072	EXXON	Alaskan Star	1	863	01-09-78	03-17-78	9,835
39	Grizzly	165		0035	EXXON	Alaskan Star	1	184	03-23-78	07-01-78	11,731
55	Yakutat	932	NO 7-2	0211	ARCO	Ocean Odyssey	1	450	04-10-83	10-22-83	17,810
COOK INLET											
	COST No. 1	489	NO 5-2		ARCO	Ocean Ranger		216	06-10-75	09-24-77	12,387
CI	Guppy	318		0086	MARATHON	Diamond M Dragon	1	120	07-21-78	12-22-78	13,315
CI	South Arch	668		0124	PHILLIPS	Ocean Bounty	1	267	10-09-78	10-19-78	1,254
CI							1A	267	10-20-78	05-18-79	11,294
CI	Coho	2	NO 5-4	0168	MARATHON	Diamond M Dragon	1	542	01-11-79	04-27-79	2,797
CI							2	542	04-29-79	08-21-79	8,907
CI	Bede	798	NO 5-2	0136	PHILLIPS	Ocean Bounty	1	245	05-28-79	09-18-79	10,324
CI	Hawk	572	NO 5-1	0161	ARCO	Dan Prince	1	133	07-15-79	01-21-80	14,975
CI	Bowhead	970	NO 5-2	0152	PHILLIPS	Ocean Bounty	1	513	09-24-79	04-26-80	13,128
CI	Raven	401		0097	ARCO	Dan Prince	1	192	04-06-80	05-29-80	7,471
CI	Ibis	576		0113	ARCO	Ocean Bounty	1	202	05-09-80	06-24-80	7,012
60	Falcon	225		0243	CHEVRON	Sedco 712	1	115	09-19-84	11-12-84	5,574
60	Cardinal	654	NO 5-3	0248	CHEVRON	Sedco 712	1	550	11-21-84	12-18-84	1,890
60							1A	550	12-18-84	03-13-85	10,130
ST. GEORGE											
	COST No. 1	459#	NN 3-1		ARCO	Ocean Ranger		440	07-02-76	09-22-76	13,771
	COST No. 2	390			ARCO	Sedco 708		369	05-19-82	09-02-82	14,626
70	Tustemena	809	NO 3-7	0530	EXXON	Doo Sung	1	420	06-29-84	09-04-84	8,800
70	Intrepid	714		0519	CHEVRON	Sedco 712	1	437	07-20-84	09-25-84	11,587
70	Rat	889		0537	ARCO	Sedco 708	1	436	08-04-84	10-30-84	12,456
70	Columbia	764		0527	EXXON	Doo Sung	1	421	09-13-84	11-19-84	12,433
70	Bertha	616	NO 3-1	0466	MOBIL	Sedco 712	1	358	09-29-84	11-03-84	8,085
70	Wolf Lake	631	NO 3-7	0511	ARCO	Sedco 708	1	390	11-07-84	12-14-84	10,862
70							1A	390	12-17-84	02-14-85	12,467
70	Fern	467	NN 3-1	0454	SHELL	Ocean Odyssey	1	420	11-20-84	01-24-85	10,277
70	Camelot	811		0477	GULF	Doo Sung	1	476	11-27-84	01-23-85	9,592
70	Monkshood	604		0463	SHELL	Ocean Odyssey	1	394	01-26-85	03-31-85	8,510
NORTH ALEUTIAN BASIN											
	COST No. 1	666	NO 4-7		ARCO	Sedco 708		297	09-08-82	01-14-83	17,115
NORTON SOUND											
	COST No. 1	197	NP 3-1		ARCO	Dan Prince		065	06-14-80	09-28-80	14,683
	COST No. 2	273	NP 3-2		ARCO	Key Singapore		049	06-07-82	09-15-82	14,889
57	Chugach	287		0414	EXXON	Middleton	1	054	06-19-84	07-23-84	3,636
57	Birch	949	NQ 3-7	0436	ARCO	Key Hawaii	1	065	06-25-84	08-19-84	10,950
57	Teton	448	NP 3-2	0430	EXXON	Middleton	1	035	07-25-84	08-16-84	4,951
57	Cascade	54		0398	EXXON	Key Hawaii	1	058	07-02-85	07-23-85	6,913
57	Yellow Pup	182		0407	EXXON	Key Hawaii	1	058	07-24-85	08-11-85	7,267
57	Chugach	361	NP 3-2	0425	EXXON	Key Hawaii	1	042	08-13-85	08-24-85	6,093

Table 6. *Alaska OCS drilling history as of January 1,1990*—continued

Sale	Prospect/ Unit name	Block	OPD No.	Lease No.	Operator	Rig	Well No.	Water Depth	Spud Date	P&A Date	Total Depth
BEAUFORT SEA											
BF	Beechy Pt.	654	NR 6-3	0191	EXXON	Salmon Island	1	018	11-01-81	03-31-82	11,638
BF							2*	018	12-27-81	03-15-82	13,441
BF	Tern	744		0195	SHELL	Tern Island	1*	021	05-28-82	09-18-82 T	13,176
BF	Tern	745		0196	SHELL	Tern Island	1*	021	10-16-82	03-03-83 T	13,399
BF	Seal	516/560		0181	SHELL	Seal Island	1*	039	02-04-84	06-30-84 T	13,078
71	Mukluk	280	NR 5-4	0334	SOHIO	Mukluk Island	1	048	11-01-83	01-24-83	9,860
71	Antares	971	NR 5-2	0280	EXXON	CIDS	1	049	11-01-84	01-18-85	8,450
71							2	049	01-19-85	04-12-85	11,608
BF	Seal	472/473 /474	NR 6-3	0180	SHELL	Seal Island	1	039	02-22-85	07-21-85	16,090
87	Hammerhead	624	NR 6-4	0849	UNOCAL	CANMAR EXP. II (D)	1*	103	08-10-85	09-24-85 T	8,034
87							2	107	9/26/86	10-11-86	6,460
71	Harvard	423/424	NR 6-3	0370	SHELL	Sandpiper Island	1*	049	09-02-85	01-25-86 T	12,575
71		425		0371	AMOCO	Sandpiper Island	2*	049	02-08-86	07-12-86	14,980
87	Orion	8	NR 5-4	0804	EXXON	CIDS	1	050	11-10-85	12-15-85	7,300
71	Mars	139/140		0302	AMOCO	Ice Island (I)	1	025	03-12-86	04-27-86	7,982
87	Corona	678	NR 6-4	0871	SHELL W.	CANMAR EXP. II (D)	1	119	07-28-86	09-18-86 T	10,000
71	Phoenix	284	NR 5-4	0338	TENNECO	SSDC /MAT	1	060	09-23-86	12-19-86	9,866
BF	Tern	788/789	NR 6-3	0197	SHELL	Tern Island	1*	021	02-10-87	05-10-87 T	14,650
87	Aurora	890	NR 7-3	0943	TENNECO	SSDC/MAT	1	068	11-02-87	08-31-88	10,000
87	Belcher	767	NR 7-3	0917	AMOCO	Kulluk	1	167	09-06-88	08-29-89	NA
NAVARIN BASIN											
	COST No. 1	801	NP 1-8		ARCO	Sedco 708		430	05-27-83	10-24-83	16,400
83	Nicole	414	NO 1-2	0707	AMOCO	Ocean Odyssey	1	443	06-07-85	08-27-85	11,030
83	Redwood	693	NP 1-7	0599	EXXON	Doo Sung	1	483	06-14-85	08-30-85	11,536
83	Danielle	227	NP 1-8	0639	AMOCO	Sedco 708	1	393	06-19-85	08-20-85	10,045
83	Packard	637	NP 1-7	0586	ARCO	Sedco 712	1	541	08-05-85	10-23-85	13,741
83	George	157		0560	AMOCO	Sedco 708	1	480	08-22-85	10-08-85	9,085
83	Redwood	606		0583	EXXON	Doo Sung	1	481	08-31-85	10-12-85	11,570
83	Misha	197	NO 1-1	0673	AMOCO	Ocean Odyssey	1	473	08-31-85	10-21-85	7,962
83	Nancy	723	NO 1-2	0719	AMOCO	Sedco 708	1	424	10-12-85	11-25-85	7,050
CHUKCHI SEA											
109	Klondike	287	NR 3-3	1482	SHELL	CANMAR EXP. III (D)	1	141	07-09-89	09-14-89	NA
109	Burger	718	NR 3-2	1413	SHELL	CANMAR EXP. III (D)	1	149	09-22-89	10-14-89 T	NA
109	Popcorn	150	NR 3-1	1275	SHELL	CANMAR EXP. III (D)	1	149	10-14-89	10-19-89 T	NA

# Tract number
(I) Artificial spray ice island
(D) Drillship
(T) Temporarily abandoned
* Determined "Producible" by MMS in accordance with OCS Order No. 4

NOTE: As used herein the P & A date is defined as the date the casing is cut and removed from the seafloor. "P & A Date" and the "Total Depth" data are derived from the MMS Well Completion or Recompletion Report and Log Form 9-330.

tal management program. Final briefs from Alaska and Amoco were due to the DOC by October 13, 1989. The DOC anticipates issuing a decision by Spring 1990.

Northstar/Seal Island Discovery

In the 1983-84 winter drilling season, Amerada Hess Corporation discovered oil on leases acquired during the 1979 joint Federal-State lease sale held in the Beaufort Sea. Amerada Hess encountered oil at a depth of 12,750 feet in the Sadlerochit Formation, which flowed 40-degree gravity oil at rates up to 5,000 bpd. In 1986, Amerada Hess drilled a delineation well in State waters that yielded a flow rate of 4,700 bpd. A total of six wells have been drilled in this prospect. Besides the two Amerada Hess wells, Northstar No. 1 and No. 2, Shell Western E&P, Inc. (SWEPI) drilled two wells from nearby Seal Island into Federal leases OCS Y-0180 and Y-0181.

In early 1989, Amerada Hess submitted a proposed unit agreement to the Alaska Division of Oil & Gas for their review and approval. This unit agreement covers five State leases (ADL 312798, 312799, 312808, 312809, and 355001) and two Federal leases (OCS Y-0179 and 0181). The Alaska Division of Oil & Gas completed its review in July 1989 and forwarded the proposed unit agreement to MMS for review. If approved, the area of development would be the first in the Beaufort Sea managed by Federal and State governments.

Under the proposal, the lease terms would be extended by 5 years, allowing time to further evaluate the area's potential. Current estimates of recoverable reserves for the area are at 150 MMBO. In exchange for the lease extension, the oil companies would develop a 5-year development plan covering the period 1990-94 that would include a reservoir analysis to help predict future production rates, additional seismic studies, and an engineering analysis that would look at development alternatives and costs. Final development plans are scheduled to be submitted to the Federal and State governments by 1994.

The State of Alaska claimed that the newly revised graduated severance tax or economic limit factor (ELF) made the area more economical. It is the development of marginally economic fields, such as Northstar, that ELF is designed to encourage. The State estimated Northstar's tax rate to be 70-80 percent lower than before the changes to the ELF legislation. (See ch. 4, p. 54, for additional discussion on the ELF).

Chukchi Sea Planning Area

Shell Western E&P Inc. (SWEPI) has submitted two exploration plans for the Chukchi Sea Planning Area during the period of this report. The first plan proposes 48 wells on 11 prospects located in remote areas (greater than 50 miles offshore); the second plan proposes 13 wells on 5 nearshore prospects (less than 50 miles offshore) over the next 9 years. Table 7 provides a list of the prospects. As part of the exploration plan, SWEPI detailed its oil-spill response plans. SWEPI will maintain a drilling fleet of four vessels, the *Canmar Explorer III* drillship, the ice breaker *Robert Lemeur*, and two support vessels, *Canmar Supplier III* and *IV*. In addition to this drill ing and support fleet, SWEPI will have onsite an oil-spill response barge to serve as the primary response in the event of a major spill or blowout. This operation will be supported by two onshore locations. Air support will be provided by the Naval Arctic Research Lab facility at Point Barrow, and marine support will be provided by the Crowley Terminal in Kotzebue. On February 17, 1989, MMS approved the plan, and SWEPI spudded the first well in the summer of 1989. More information on SWEPI's Chukchi Sea prospects follows.

Klondike Prospect

In September 1989, SWEPI completed the first of several exploratory wells planned for the Chukchi Sea Planning Area. The Klondike Prospect on lease OCS Y-1482, Block 287, is located approximately 76 miles northwest of Icy Cape in 140 feet of water. (Shell, along with partners Elf Aquitaine and Conoco, acquired 81 Chukchi Sea leases for $285.5 million at OCS Lease Sale 109 held May 25, 1988.) The well, spudded on July 7, 1989, using the *Canmar Explorer III* drillship, is the first of eight exploratory wells that Shell proposes to drill on this prospect. The well was plugged and abandoned on September 14, 1989.

Burger Prospect

Shell's Burger Prospect is located approximately 50 miles northeast of its Klondike Prospect, in approximately 145 feet of water. The first of nine proposed exploratory wells to be drilled on this prospect was spudded on September 22, 1989, on lease OCS Y-1413, Block 718. The well was tem-

Table 7. *Shell Western E&P's proposed exploratory well locations**

Prospect Name (OPD No.)**	Block No.	Well Name	Water Depth (ft)
Remote Offshore Prospects			
Baby Ruth	854	OCS-Y-1365-1	140
(NR 3-1)	855	OCS-Y-1366-1	140
Blizzard	198	OCS-Y-1386-1	130
(NR 3-2)	274	OCS-Y-1391-1	130
	230	OCS-Y-1389-1	130
Burger	718	OCS-Y-1413-1	145
(NR 3-2)	761	OCS-Y-1421-1	145
	630	OCS-Y-1400-1	145
	720	OCS-Y-1415-1	145
	673	OCS-Y-1405-1	145
	807	OCS-Y-1430-1	145
	629	OCS-Y-1399-1	145
	760	OCS-Y-1420-1	145
	672	OCS-Y-1404-1	145
Burrito	271	OCS-Y-1185-1	175
(NS 3-7)	227	OCS-Y-1183-1	175
Cerveza	373	OCS-Y-1176-1	180
(NS 3-7)	460	OCS-Y-1178-1	180
Crackerjack	502	OCS-Y-1305-1	140
(NR 3-1)	501	OCS-Y-1304-1	140
	591	OCS-Y-1320-1	140
	592	OCS-Y-1321-1	140
	762	OCS-Y-1350-1	140
	676	OCS-Y-1335-1	140
	677	OCS-Y-1336-1	140
	807	OCS-Y-1359-1	140
	632	OCS-Y-1326-1	140
Klondike	287	OCS-Y-1482-1	140
(NR 3-3)	241	OCS-Y-1476-1	140
	156	OCS-Y-1466-1	140
	418	OCS-Y-1494-1	140
	155	OCS-Y-1465-1	140
	109	OCS-Y-1456-1	140
	152	OCS-Y-1462-1	140
	288	OCS-Y-1483-1	140
Nacho Supreme	574	OCS-Y-1204-1	170
(NS 3-7)	618	OCS-Y-1207-1	170
	531	OCS-Y-1203-1	170
Popcorn	150	OCS-Y-1275-1	140
(NR 3-1)	150	OCS-Y-1275-1	140
	150	OCS-Y-1275-2	140
	107	OCS-Y-1265-1	140
	106	OCS-Y-1264-1	140
	106	OCS-Y-1264-2	140
Praline	317	OCS-Y-1189-1	175
(NS 3-7)	229	OCS-Y-1184-1	175
Taco	400	OCS-Y-1196-1	180
(NS 3-7)	488	OCS-Y-1200-1	180
	444	OCS-Y-1198-1	180
Near Offshore Prospects			
Bagel	143	OCS-Y-1525-1	80
(NR 3-6)	98	OCS-Y-1520-1	80
Bearclaw	2	OCS-Y-1509-1	125
(NR 3-6)			
Eclair	58	OCS-Y-1518-1	65
(NR 3-6)	13	OCS-Y-1512-1	65
Kolache	49	OCS-Y-1516-1	110
(NR 3-6)	5	OCS-Y-1510-1	110
	6	OCS-Y-1511-1	110
	50	OCS-Y-1517-1	110
Napoleon	756	OCS-Y-1506-1	120
(NR 3-4)	756	OCS-Y-1506-2	120
	755	OCS-Y-1505-1	120
	756	OCS-Y-1506-3	

* In spite of the large number of identified well locations, the total number drilled in any single year is not expected to be more than one or two wells. Partially, this number is limited by the availability of rigs capable of drilling in the rigorous Arctic conditions of the Chukchi Sea. The actual number of wells drilling in any single year will depend strongly on the results of early wells.

** OPD = Official Protraction Diagram

porarily abandoned on October 14, 1989, at the end of the summer drilling season. Shell then moved the *Canmar Explorer III* drillship to its Popcorn Prospect.

Popcorn Prospect

The Popcorn Prospect, located approximately 140 miles offshore Icy Cape, is the furthest offshore prospect drilled by Shell in the Chukchi Sea to date. Shell plans to drill a total of five wells on this prospect. The first well was spudded on October 14, 1989, and was temporarily abanddoned on October 19, 1989, at the end of the summer drilling season.

Alaska State Offshore Oil and Gas Program

State of Alaska Lease Sales

Unlike the DOI's 5-Year OCS Oil and Gas Leasing Program, which is submitted to Congress every 5 years, the State of Alaska's 5-year program is submitted to the

State legislature each year by the Commissioner of the Department of Natural Resources (DNR). Like the DOI's program, the purpose of the State of Alaska's program is to provide a fixed and predictable leasing schedule. Authority for the program is provided under title 38 of the Alaska Statutes, which gives primary responsibility of the leasing program to the DNR.

Under the January 1989 Alaska 5-Year Oil and Gas Leasing Program, only two sales occurred. Lease Sale 52, Beaufort Sea, took place on January 24, 1989. Forty-three tracts were offered for lease, with 15 receiving bids for a total of $1,737,513 in high bids. Four companies won bids, with Phillips Petroleum being the most active by bidding on seven tracts and winning five. Chevron, however, submitted the lease sale's highest bid of $413,575 for tract 29.

Also on January 24, 1989, the DNR held Exempt Lease Sale 72A on Oliktok Point. This sale consisted of one tract that was formerly the U.S. Air Force Oliktok Point Defense Early Warning (DEW) Line Station. It became available for lease when the oil and gas estate was conveyed to the State on July 27, 1988. However, the Federal Government retains the surface rights, and any resource development would have to occur from adjacent State leases. This tract met exempt criteria under AS 38.05.180(d)(3), which allows lands not on the schedule to be leased if the land is adjacent to land owned or controlled by another party on which a discovery of commercial quantities of oil or gas has been made. In this case, the Oliktok Point tract is surrounded by the Kuparuk River unit. ARCO was the sole bidder on this tract and won it for $454,977.

In April 1989, the State postponed the proposed Cook Inlet Exempt Sale 67A, which had been scheduled for June 27, 1989, to allow more time for comment following the *Exxon Valdez* tanker oil spill. In June 1989, the State legislature entirely suspended the January 1989 Five-Year Oil and Gas Program by eliminating funding for the remaining sales on the lease schedule.

Table 8. *Proposed 1990 Alaska 5-Year Oil and Gas Leasing Program*

No.	Area	Tentative date
67A	Cook Inlet	September 1990
70A	Kuparuk Uplands	September 1990
64	Kavik	May 1991
65	Beaufort Sea	May 1991
74	Cook Inlet	September 1991
61	White Hills	January 1992
68	Beaufort Sea	May 1992
75	Kuparuk Uplands	September 1992
76	Cook Inlet	January 1993
77	Nanushuk	May 1993
57	North Slope Foothills	September 1993

Source: Oil and Gas Journal.

The Alaska DNR is proceeding under the assumption that funds will be available for lease sales in 1990 and beyond, and is therefore developing the January 1990 five-year lease sale schedule. This proposed schedule is shown in table 8 above. Lease Sales 67A and 70A, Cook Inlet and North Slope, respectively, have been rescheduled from June and September 1989 to September 1990, and are currently the only sales scheduled for 1990. All of these proposed sales depend on legislative funding. The State's fiscal year 1991 begins in July 1990, so it may be early summer before the possibility of the sales being held is known.

Since 1959, the State of Alaska has conducted 57 lease sales. Of these lease sales, 37 have offered some offshore acreage while 7 of these were entirely offshore. Currently, there are 1.6 million offshore acres under lease. Figure 9 shows offshore leaseholders by percentage of acreage held.

Exploration in State Waters and Coastal Areas

After a hiatus in exploration activities in State waters and coastal areas from January

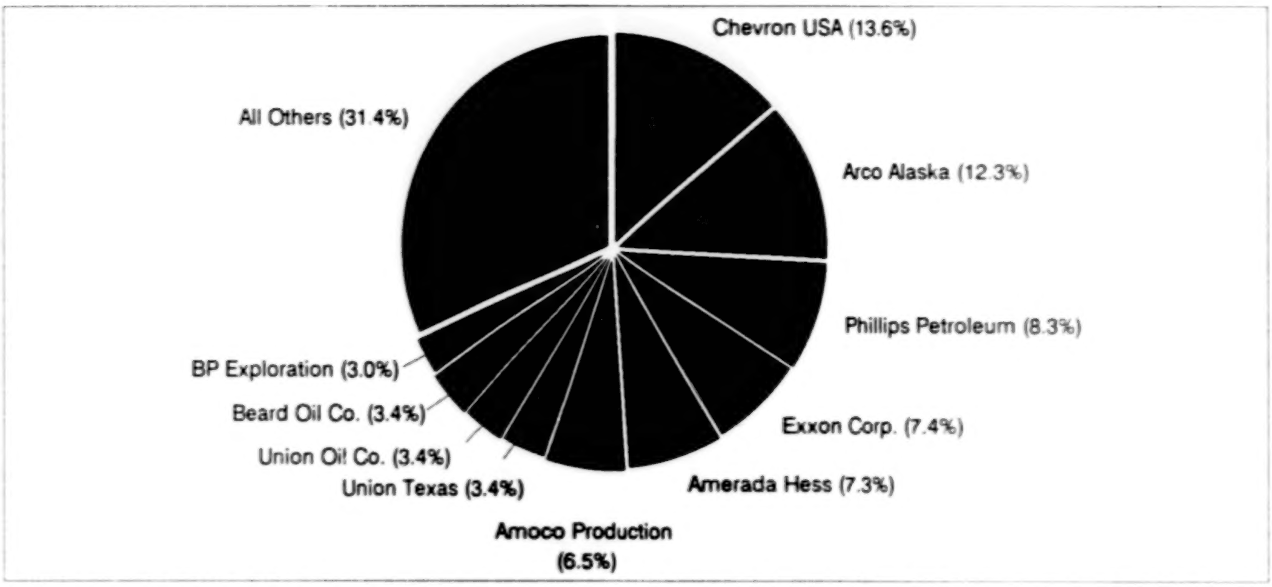


Figure 9. *Major State of Alaska offshore leaseholders, by percentages of acreage held as of January 1990.*

1987 to August 1988, when most operators in Alaska focused their attention on development projects, several exploration projects commenced. These projects were concentrated on the North Slope and in the State waters of the Beaufort Sea. The status for both exploration and development projects in State waters and in coastal areas can be found in table 9.

Point McIntyre Prospect

One of the more active exploration projects during 1989 is located 2 miles north-northwest of the Prudhoe Bay State No. 1 well, the discovery well for North America's largest oil field. The Point McIntyre Prospect is located outside the Prudhoe Bay Unit, directly on the coast. Furthermore, Point McIntyre is only 2 miles southeast of the Gwydyr Bay Unit, which has estimated oil resources of 30-60 MMbbl of oil, but is still uneconomic by North Slope standards. The original Point McIntyre No. 1 and No. 2 wells were spudded in 1977 by Gulf Oil Company. Since that time Gulf sold their interest to other companies. The current leaseholders of Point McIntyre, ARCO, Exxon, and BP, originally spudded Point McIntyre No. 3 on March 12, 1988, but ceased drilling in April of 1988. ARCO, the operator for the Point McIntyre Project, reentered the well in January 1989 and drilled to a depth of 8,500 feet, where they encountered a sustained flow rate of 2,500 bpd during test operations. ARCO continued delineation efforts by drilling two more wells, Point McIntyre No. 4 and No. 5, during the first half of 1989. These delineation wells indicated that the reservoir lies almost entirely offshore but is capable of being reached by directionally drilling at sharp angles from shore-based rigs. Point McIntyre No. 4 yielded flow rates of 5,350 bpd at a depth of 8,800 feet. According to ARCO, it appears that the reservoir has excellent porosity and permeability, with initial estimates placing resources at about 300 MMbbl. Initial analysis indicates the Point McIntyre Prospect is a submarine fan complex, with subsequent deformation resulting in horst and graben faulting (oral commun., Jerry Dees, ARCO; 9/15/89). In October, ARCO submitted an application to drill Point McIntyre wells No. 6, No. 7, and No. 8. ARCO was granted the necessary permits

Table 9. *Status of Aaska State coastal exploration, development, and production projects*

Unit/Field/ Prospect	Designated Operator	Lease Sale	Sale Date	Reserves(1) in Place	Reserves(1) Recoverable	API Gravity	Exploratory Drilling	Delin- eation	Devel- opment	Primary Prod.	Secondary Prod.	Tertiary Prod.	Status as of December 1989
NORTH SLOPE AREA													
Colville Delta (Texaco)	Texaco			N/A	N/A	N/A	X						No activity.
Duck Island Unit (Endicott)	BP Exxon	State Sale 23 & BF(SM)	09/10/69 12/12/79	1000 MBO	0.8 Tcf 375 MMBO	23 degrees	X	X	X	X			Maintain production at 100,000 bpd.
Gwydyr Bay Unit	ARCO	State Sale 23	09/10/69		30-60 MMBO		X	X					Total of 12 wells. Renewed interest in prospect by Vaughn Petroleum (et al.) in 1987. Drilled 2 wells both P&A. Reduced reserve estimates & wait for higher oil price. Conoco resigns as operator.
Kaktovik Prospect (KIC well)	Chevron	Negoti- ated with ASRC	11/83	N/A	N/A	N/A	X						Tight hole.
Kuparuk Unit	ARCO	State Sale 14	07/14/65	4400 MBO	1070 MMBO	23 degrees	X	X	X	X	X	X	Steady production at 280,000 bpd; 39% oil field depleted.
Lisburne Field	ARCO	State Sale 18	01/24/67	3000 MBO	165 MMBO	28 degrees	X	X	X	X	X		Recoverable reserve estimates reduced 50%.
Milne Point Unit	Conoco	State Sale 14	07/14/65		60 MMBO	22 degrees	X	X	X	X			Shutdown since 1/87; Conoco received drilling permits. Plans to begin production again.
Niakuk Prospect	BP	State Sales 14 & 18	07/15/65 01/24/67	145 MBO 88 Bcf	58 MBO 35 Bcf	25 degrees	X	X	X				ACOE rescinded earlier causeway denial. BP must submit additional data on causeway.
North Star	Amerada Hess			N/A	150 MMBO	40 degrees	X	X	X				Initial stages of development; proposed unit agreement.
Pt. McIntyre	ARCO	State Sale 14	07/14/65	N/A	300 MMBO	N/A	X	X					Drilled three wells in 1988 and 1989 with approved drilling permits for three more.
Point Thomson Unit	Exxon	State Sale 18	01/24/67		350 MMBO 5 Tcf	37 degrees	X	X					Will drill another delineation well spring 1990.

Table 9. *Status of Aaska State coastal exploration, development, and production projects*—continued

Unit/Field/ Prospect	Designated Operator	Lease Sale	Sale Date	Reserves(1) in Place	Reserves(1) Recoverable	API Gravity	Exploratory Drilling	Delineation	Development	Primary Prod.	Secondary Prod.	Tertiary Prod.	Status as of December 1989
Prudhoe Bay Unit	ARCO/ BP	State Sale 13 Sale 14 Sale 18	 12/09/64 07/14/65 01/24/67	23.5 BBO	9.4 BBO 29 Tcf	26.4 degrees	X	X	X	X	X	X	Enhanced recovery techniques & good reservoir management will keep production at 1.5 MMbpd through 1989 with slower production decline now anticipated. Eileen West End field started producing in June 1988. Peak production will be 60 - 70,000 bpd in 1990 from 76 wells.
UGNU Field in Kuparuk/ Prudhoe/ Milne	ARCO	State Sale 13 Sale 14 Sale 18	 12/09/64 07/14/65 01/24/67	6-11 BBO	0	11 degrees	X						Drilled production test well 4/89. Loose sandstone reservoir and low API gravity present major technological hurdles.
West Sak Field	ARCO	BF(SM)	12/12/79	15-25 BBO	750 MMBO	22.4 degrees	X	X					ARCO filed application with ACOE to build gravel pads. Subsequently delayed citing impact of ELF.
						COOK INLET OFFSHORE							
Granite Point	Mobil				22 MMBO 0.016 Tcf	35.3 degrees	X	X	X	X	X		Oil field 87% depleted; 8,100 bpd, 7,133 Mcfd.
McArthur River	Union				*	35.3 degrees	X	X	X	X	X		Oil field 93% depleted; 21,600 bpd, 46,100 Mcfd.
Middle Ground Shoal	Amoco	State Sale 9	07/07/62		11 MMBO 0.006 Tcf	35.3 degrees	X	X	X	X	X		Oil field 95% depleted; 8,200 bpd, 4,600 Mcfd.
North Cook Inlet	Phillips	State Sale 7	12/19/61		0.850 Tcf		X	X	X	X			Gas field 55% depleted; 112,300 Mcfd.
Trading Bay Field	Union	State Sales 7	12/19/61 07/07/62		2 MMBO	35.3 degrees	X	X	X	X	X		Oil field 99% depleted; gas field 68% depleted.

* Reserve estimate combined with Trading Bay Field.

(1) Reserves measured in millions and billions of barrels of oil (MMBO, BBO) and in trillions of cubic feet of gas (Tcf).

SOURCE: Alaska Department of Natural Resources 1989.

to drill wells No. 7 and No. 8 in November 1989. In addition to these delineation wells, ARCO plans to conduct three-dimensional seismic work in the winter of 1989-90 to further delineate the structure.

In October of 1989, ARCO applied to the Alaska Division of Oil and Gas to reduce the royalty rate on the Point McIntyre leases from 12.5 percent to 5 percent. ARCO applied for this reduced rate under a State statute that was repealed in 1969, but is still in effect for leases awarded prior to it being repealed. The Alaska Division of Oil and Gas published a public notice regarding ARCO's request and received comments until December 1, 1989. The State had previously approved the same royalty reduction for BP's Niakuk and Endicott projects.

Karluk Prospect

On February 19, 1989, Chevron USA spudded its Karluk No. 1 well within State waters adjacent to Federal lease OCS Y-0194, Block 700. The well, located about 3.5 miles west-southwest of Karluk Island was drilled from an ice island similar to that used by Amoco Production Co. when it drilled its Mars well. Seawater was pumped from the area and then sprayed into the air, where it freezes. The ice then falls to the seafloor to form an island. Chevron used the Pool Arctic Alaska drilling rig No. 4 to drill the well. The well was plugged and abandoned on April 8, 1989.

Stinson Prospect

On September 1, 1987, ARCO and Phillips Petroleum Company, among others, acquired several leases in Alaska State Sale 50, located in Camden Bay off the northwestern boundary of the Arctic National Wildlife Refuge (ANWR). In December 1988, ARCO began seeking permits from the State and the North Slope Borough for their Stinson Prospect located on State offshore lease ADL No. 371024. Although this lease is wholly owned by Phillips, ARCO owns jointly or separately, all surrounding leases, and through an agreement with Phillips, will serve as operator for lease evaluation efforts. In June 1989, ARCO applied to the Alaska Oil and Gas Conservation Commission for an exception to State drilling regulations to locate their proposed well closer than 500 feet to the north lease boundary. This exception was approved July 11, 1989. ARCO and Phillips paid about $1 million each for the leases on which the well will be located and the one directly adjacent to the north.

Initially, ARCO planned to construct a gravel island on this lease for exploratory drilling purposes. However, after evaluating the gravel pits that would provide the material for the island, ARCO discovered one pit to be essentially depleted and the other not yet open. Further discussions with State officials regarding mining gravel for an artificial island prompted ARCO to negotiate a contract for *Glomar Beaufort Sea I*, a bottom-founded mobile offshore drilling unit. The *Glomar Beaufort Sea I* is a concrete island drilling structure (CIDS). It had previously been used by Exxon in the Beaufort to drill some prospects in the 1984-85 and 1985-86 drilling seasons.

The CIDS was moved to the Stinson drilling site in September from where it had been stored near Prudhoe Bay. The drilling site is approximately 2.5 miles off of the ANWR and about 60 miles east of Prudhoe Bay and 35 miles west of Kaktovik. Initial plans call for a vertical well to a planned depth of 16,000 feet. Drilling and testing of the initial well is expected to take about 185 days. Since the drilling unit would be frozen in place, plans for any subsequent well would be to directionally drill the well to a different bottomhole location.

However, new techniques are being proposed and studied that would permit an operator to relocate a bottom-founded or an ice-reinforced floating drilling unit during the winter drilling season. Typically, an operator can hope to drill 1.5 wells per season from a single location with the unit being moved during ice breakup to a new surface drilling location. These seasonal drilling limits are a significant part of the high exploration costs in the Beaufort and Chukchi Seas. One technique being suggested by Standard Oil Company (now British Petroleum) is to cut the ice into blocks with high pressure water jets, whereby a channel would be created to tow the drilling unit to a new location. Trucks with winches would be deployed on the surrounding ice pack to lift and carry the ice blocks out of the path of the drilling unit. Ice breaking tugs would be used to clear a path for the drilling unit and pull it to its new destination. Standard estimates the cost of maintaining ice breakers and cutting the ice are outweighed by the savings from extending the drilling season. It appears that the months of March and April would provide the most ideal conditions for relocating the drilling unit since the ice pack is very stable and would easily support ice roads and heavy moving equipment. Standard estimates that a drilling unit could be moved about 2 miles per day in landfast ice and up to 5 miles per day in a moving ice pack (*Offshore*, April 1989, p. 52-53).

Badami Prospect

In September 1985, at Alaska State Sale 45A, Conoco Inc. acquired five leases, which are located on State onshore lands approximately 22 miles west of the ANWR adjacent to Mikkelson Bay. Conoco plans to spud a well in late January 1990 from an ice pad and directionally drill 600 feet offshore. Conoco proposes to build a 28-mile ice road from an existing gravel road that services the Endicott Project. Conoco estimates that they will complete their work by May 15, 1990. Should Conoco make a discovery, additional wells would probably be drilled in 1991.

Point Thompson Unit

In January of 1967, Exxon, alone and with others, acquired several leases in Alaska State Sale 18 in the eastern Beaufort Sea and adjacent coastal areas. Exxon discovered the Point Thompson field in 1977 in a well drilled from Flaxman Island. A total of 15 wells have been drilled on the 130,000 acre Point Thompson Unit since 1977. Under terms of the unit agreement with the State of Alaska, Exxon must drill a well this season to further delineate the field. Point Thompson No. 5, the approved well, will be directionally drilled to a depth of 15,000 feet from a surface location at the far west end of Challenge Island in the Maguire Island group. Exxon plans on drilling the well in March and April of 1990. Exxon is trying to reduce costs of the $30 million test well by moving gravel from the Point Thompson No. 4 pad to construct the new pad for Point Thompson No. 5. Work on the gravel pad is expected to start in December 1989. Exxon will also share costs of an ice road with Conoco for their Badami Prospect.

Currently, the Point Thompson field is believed to be about 23 miles long by 5.5 miles wide. Although the field is estimated to contain 350 MMbbl of oil, mostly in the form of condensate, it is the tremendous gas reserves at 5 Tcf that are of even greater interest. However, because of the lack of a transportation system for natural gas, the Point Thompson field and the 26 Tcf of gas at Prudhoe Bay are considered uneconomical at this time. Various natural gas transportation systems have been proposed to transport North Slope natural gas to markets. The status of these projects, such as the Trans-Alaska Gas System (TAGS) and the Alaska Natural Gas Transportation System (ANGTS), are discussed in chapter 3.

Development in State Waters and Coastal Areas

Niakuk Prospect

The Niakuk field is a small complex reservoir in the highly faulted Kuparuk sands located in Alaska State waters west of the Endicott field. The State leases overlying this field were obtained in 1965 and 1967. A total of nine wells have been drilled in an effort to delineate the Niakuk field. The Niakuk field is estimated to ultimately produce 58 MMbbl of oil over a 15-year period. The development project entails expanding an existing gravel island located in 4.5 feet of water on which Niakuk wells 4, 5, and 6 are located. The development plan calls for construction of a 6,600-foot gravel causeway with a 350-foot breach for water circulation and fish passage. The project would be connected to the Lisburne development facilities by an onshore gravel road. In October of 1988, the Army Corps of Engineers (ACOE) denied BP's (then Standard Oil Co.) development plan on the basis of their proposed gravel causeway. The ACOE's position was that BP's proposed 1.25-mile causeway, in conjunction with the two existing causeways (West Dock and Endicott), would significantly change the offshore environment. The ACOE further stated that future offshore development plans should not rely on causeways but rather should contain plans to develop fields by directional drilling or buried pipelines (Petroleum Information, *Alaska Report*, Oct. 12, 1988 issue, p. 2). BP maintained that the causeway is essential to the economic viability of the project. Directionally drilling from onshore is made much more difficult because of the intervening Niakuk fault. Also, the potential for reduced reserves stemming from design impacts on the enhanced-oil recovery waterflood project, which accounts for up to 21 percent of the total projected reserves.

However, in late February 1989, the ACOE rescinded its earlier decision of denying the Niakuk causeway. In a letter from the ACOE to BP, the ACOE stated that BP's proposed project, including the causeway, remains open to further information and that the ACOE withdrew the conditional permit issued to BP that prohibited the causeway. The ACOE maintained that the policy prohibiting the causeway was rescinded because it contained technical errors and was issued without public input. The ACOE then formed a panel of fish experts to review information on causeways to determine whether these artificial gravel structures harm fish. An ACOE report released in late November 1989 indicated that there should be a cautious approach to causeway construction projects but that not enough data had been gathered on those fish populations to establish a link between physical changes and any changes in fish populations. BP had already submitted some information during the permitting process that would answer some questions on fish population impacts and must now submit additional data to prove that the causeway will not harm fish stocks. There is no regulatory time limit for a decision by the ACOE on BP's permit. At this time, it is unclear when a decision will be made. However, the North Slope Borough has acted upon previously submitted data by issuing BP a local zoning permit for the Niakuk Project.

Prudhoe Bay Unit

After 12 years of producing oil, the Prudhoe Bay field started to decline in average daily production during 1989. The average daily production in 1988 was 1.6 MMbpd, but estimated production in the fall of 1989 indicated that the average daily production for 1989 would be about 1.4 MMbpd. By 1994 average daily production is estimated to fall below 1 MMbpd (Alaska Division of Natural Resources, "Historical and Projected Oil and Gas Consumption," January 1989). Although the Prudhoe Bay field is beginning to decline, ARCO and BP have prolonged the decline's arrival through enhanced recovery techniques, as well as slowed the rate of decline. Originally, the field had been expected to begin its decline in 1986. More recently, BP awarded engineering and construction contracts for a $70 million expansion of the existing water processing facilities. Two facilities will be upgraded by increasing their water handling capabilities. These units separate produced water from oil and gas for reinjection into the reservoir.

Eileen/West End and Hurl State are two other fields that are located in the Prudhoe Bay unit, but that are geologically separate from the main Prudhoe Bay reservoir. Both fields are located at the western edge of the Prudhoe Bay field. BP Exploration has been drilling at Eileen/West End since 1987. Eileen/West End is a 72-well program with initial production estimated at 20,000 bpd. BP estimates production of Eileen/West End will reach 65,000 bpd by the early 1990's. Total recoverable reserves are estimated at 111 MMBO. A 28-mile pipeline will transport the crude to BP's Gathering Center No. 2.

The Hurl State field is an $85 million project that, like Eileen/West End, is expected to help maintain Prudhoe Bay production. The Hurl State Project is smaller than Eileen/West End and involves the drilling of 16 production wells and four water-injection wells. Construction of three 60-ton oil field modules will take place in Alaska and then be transported to the North Slope. Daily production is expected to be about 5,000 bpd initially and increasing to 14,000 bpd by 1991. BP estimates ultimate production from Hurl State will be 37 MMBO.

In June 1989, BP announced deferment of the Hurl State Project citing the impact of new State legislation on this project. The Alaska State legislature passed a revision to the existing tax law, the economic limit factor (ELF). The ELF is a graduated tax that reduces the tax as oil production rates decline. Under the ELF, more productive wells pay higher taxes, whereas less productive wells pay less in tax. The action by the legislature increased the severance tax on production from Prudhoe Bay field from 12.5 percent to 15 percent and Kuparuk River field from 8.5 percent to 14 percent. BP announced that the change in ELF is projected to cost them an additional $85 million in severance taxes in 1989 and more in 1990. Consequently, they made a decision to defer the project (see additional discussion of ELF in ch. 4, p. 54).

West Sak Field

In late 1988, ARCO filed a permit application with the Army Corps of Engineers (ACOE) to begin work to test production techniques for the West Sak field. The West Sak is estimated to contain 15-25 BBO in place in a shallow sandstone reservoir overlying the Kuparuk River field. There are two major production hurdles to overcome in this field. First, the crude oil is heavier and colder than oil in the Kuparuk Formation. Second, the reservoir formation is an unconsolidated sand, which when exposed to production stimulation techniques that would solve the first problem, creates another problem by compromising the structural integrity of the reservoir and consequently clogging production equipment with sand. ARCO believes they possess the technology to successfully address these problems and has therefore proposed to drill a test well at a cost of $4 to $5 million. If successful, up to 24 more wells could be drilled by 1991.

ARCO indefinitely delayed the $58 million drilling and production test program in June 1989, citing the impact of the revision to the ELF tax law. Since the West Sak reservoir overlies the Kuparuk Formation, the field would be produced using the Kuparuk River facilities. This would subject the West Sak field to the same revised ELF tax rates as Kuparuk. Full production was estimated for the mid-1990's with as much as

200,000 bpd being produced. Total cost of the project would approach $2 billion (*Oil and Gas Journal*, p. 28, June 26, 1989).

Endicott Field

The Endicott field is the only offshore producing field in U.S. Arctic waters. The Duck Island unit is the State's administrative name for the leases involved in the Endicott Project. This development project is the result of leases acquired by Standard Oil Company (now BP) in the joint Federal-State Lease Sale BF of 1979. The project consists of (1) a main production island, (2) a satellite drilling island, and (3) gravel causeways connecting the islands to each other and to shore. The main production island contains all production facilities from which up to 70 wells will be drilled. The satellite island will contribute up to another 50 wells. Full production began from Endicott in October 1987 and has averaged about 100,000 bpd since that time.

As constructed, the project consists of 5 miles of gravel causeway with 700 feet of breach for water circulation and fish passage. As one of the conditions of approval, a causeway monitoring program was established. The Endicott Mitigation Advisory Group (EMAG), consisting of several Federal and State agencies, is charged with overseeing the monitoring program. The monitoring program examines changes in salinity and temperature from one side of the causeway to the other, as well as the effectiveness of the breaches relative to fish passage. If sufficient differences in these parameters exist, the mitigating measure would be to increase the causeway breaches up to a maximum of 2,000 feet. The EMAG is in the process of providing recommendations to the ACOE on what, if any, mitigation should occur.

Other North Slope Coastal Fields

The State Division of Oil & Gas has substantially lowered recoverable reserve estimates for the Lisburne field. Original estimates for recoverable reserves were 380 MMBO with daily production averaging 100,000 bpd. According to the State Division of Oil & Gas, the reservoir is not performing as originally anticipated. Daily production has averaged between 30,000 and 40,000 bpd. The revised recoverable reserve estimates have been dropped to 165 MMBO.

The Milne Point field is known as a textbook example of how a company can develop a small field on the North Slope. The field started producing in November 1985 and subsequently shut down production in January 1987 because of the effect the decline in oil prices had on small fields, especially on the North Slope. Milne Point was marginally profitable when oil was $30 per barrel, but the owners lost money as the price of oil dropped to $12 per barrel. Conoco, the operator of the field, announced in January 1989 that it would resume production of this marginal field. Although oil prices for North Slope crude oil are around $20 per barrel, Conoco has dramatically cut operating costs through automation of equipment and reductions in required staff. In 1986, there were 186 people operating the field at Milne Point, but Conoco will need only 60 people when production resumes. As a result Conoco has dropped operating costs from $30 per barrel to $20 per barrel. The next 18 months will be spent drilling more wells and installing facilities that will boost production to the maximum design capacity of 32,000 bpd. Conoco received drilling permits for three new wells in March 1989 and plans to spud during 1989 or early 1990.

Production in Alaska

The majority of Alaska's oil production comes from either the Cook Inlet area or the North Slope. Oil production began in Cook Inlet in the 1950's and on the North Slope in 1977. The Cook Inlet fields are very mature and are reaching depletion. See table 9 (p. 33) for additional information.

The giant Prudhoe Bay onshore field is now 59 percent depleted, with production of oil estimated to fall below 1 MMbpd by 1994. Although the North Slope contains major accumulations of natural gas, the lack of a transportation system means these substantial reserves are uneconomic at this time. However, several fields in Cook Inlet produce natural gas for markets in the southern and central part of the State.

In State offshore waters, the Endicott field has completed 2 years of production averaging about 100,000 bpd. The field is only about 8 percent depleted, but its daily production is estimated by the Alaska State Division of Oil & Gas to drop to 75,000 bpd by 1993 and 50,000 bpd by 1998. Table 10 shows production statistics for offshore fields in Alaska.

As mentioned above, the Cook Inlet offshore fields are very mature, but do produce oil and natural gas, even though declining amounts. Additionally, 6,000 bpd of Cook Inlet crude oil is exported to a Pacific rim nation. The exportation of this crude oil is the result of a Presidential Directive signed in 1985 that allowed this exemption from various laws (see ch. 3 for additional information).

In March 1988, ARCO completed its discovery well of the Point McIntyre Prospect. Since that time, two additional delineation wells have been drilled, with three more planned for the 1989-90 drilling season. Preliminary analysis indicates that this field is primarily located in State offshore waters to the northwest of the Prudhoe Bay unit. Early estimates for this field place recoverable reserves around 300 MMBO. Although it will be several years before this oil is produced, it will represent a significant boost in production as other fields continue or start to decline. Similarly, the proposed Northstar-Seal Island unit, if approved and developed, could also help to offset production declines in currently producing fields.

Additional Readings

Minerals Management Service. 1989. *Mercury in the Marine Environment*. MMS 89-0049, 190 p. Available from the Alaska OCS Region Library, 949 East 36th Ave., Room 110, Anchorage, AK 99508-4302.

Table 10. *State of Alaska offshore production statistics as of January 1990*

Field	1988	1989	Cumulative (1/66–1/90)
Granite Point			
Oil (bbl)	2,651,941	2,275,399	111,797,474
Gas/associated and dry (Mcf)	2,536,558	2,244,834	97,177,421
McArthur River			
Oil (bbl)	7,138,482	6,955,470	544,514,618
Gas/associated and dry (Mcf)	16,637,062	31,133,591	378,387,434
Middle Ground Shoal			
Oil (bbl)	2,726,910	2,769,013	11,942,214
Gas/associated and dry (Mcf)	1,551,676	1,927,643	83,126,885
North Cook Inlet			
Oil (bbl)	0	0	0
Gas/associated and dry (Mcf)	45,154,220	45,285,632	914,678,311
Trading Bay			
Oil (bbl)	890,523	1,262,811	91,613,935
Gas/associated and dry (Mcf)	1,309,502	1,431,872	66,941,599
Endicott			
Oil (bbl)	37,341,179	36,094,666	85,523,165
Gas/associated and dry (Mcf)	35,045,111	41,432,864	88,855,445
Total Offshore Production			
Oil (bbl)	50,749,035	49,357,359	900,390,791
Gas/associated and dry (Mcf)	102,234,129	123,456,436	1,629,167,095

BLANK PAGE

3. Oil and Gas Transportation and Onshore Support Facilities

Vessel Transportation

Arctic Sealift

The Arctic sealift, which dates back to 1968, has transported over 1 million tons of equipment, fabricated in the continental United States, for use in the development of oil and gas on Alaska's North Slope. Except for 1988, the Arctic sealift has occurred on an annual basis (see sidebar for more information). The 1989 sealift, consisting of 3 barges carrying 33 modules, left Portland, Oregon, on July 20, 1989, and arrived in Prudhoe Bay on August 11, 1989. Most of the 33 modules will be used to expand and improve facilities that handle water produced in the Prudhoe Bay field during oil production. Once installed, the modules will increase the water handling capability to 650,000 bpd, which will double the capacity at Flow Station No. 2 on the Trans-Alaska Pipeline. Two of the modules will be used for additional drilling sites at ARCO Alaska's Kuparuk River oil field.

Arctic Sealifts

Year	Barges	Tonage
1968	2	5,529
1969	31	75,000
1970	36	187,000
1971	6	16,022
1972	2	6,192
1973	8	21,000
1974	16	65,650
1975	47	154,420
1976	21	64,324
1977	7	45,790
1978	10	39,558
1979	2	7,984
1980	10	39,558
1981	14	55,446
1982	15	69,600
1983	26	96,500
1984	11	30,089
1985	13	48,159
1986	27	103,033
1987	5	25,443
1988	0	0
1989	3	5,341
	312	1,161,638

Source: 1968–1988,Alaska Journal of Commerce and Pacific Rim Reporter; 08/10/87. 1989, oral communication, ARCO, January 1990.

Regulation of Tankers Transporting Alaskan Crude

Congress passed the U.S. Merchant Marine Act in 1936 in an effort (1) to keep the U.S. Merchant Marine fleet competitive with other nations where shipbuilding is less costly and (2) to ensure an available source of ships during wartime. This act allowed, among other things, for Federal subsidies for U.S. companies building ships in the United States. These Federal subsidies were of two types: (1) a construction differential subsidy and (2) an operational subsidy for crew wages, insurance, and maintenance and repairs. Vessels constructed using this subsidy provision were excluded from domestic shipping. The act originally allowed for a construction differential subsidy for ocean liner vessels. It was not until 1970 that Congress amended the act to include tankers and dry bulk carriers in the construction differential subsidy. Several very large crude carriers (VLCC) were built under this subsidy for use only in international trade. The construction differential subsidy has not been funded since 1981.

In 1985, the Secretary of the Department of Transportation (DOT) issued a regulation allowing tanker owners to repay their construction differential subsidies in order to allow them to conduct domestic trade. The DOT cited cost figures of 4.5 times as much to ship crude in a 37,500-ton tanker as it does in a 250,000-ton supertanker. This regulation was opposed by the small shipping companies that controlled most of the Alaska oil trade. The window of opportunity to enter back into domestic trade for subsidized vessels lasted for about a year before the U.S. Circuit Court of Appeals agreed with the plaintiffs' contention that the Secretary failed to provide a sufficiently reasoned discussion of why this rule was adopted and alternatives were rejected. However, during this period, four VLCC's repaid their subsidies and have been operating in the domestic trade since 1987: the *ARCO Independence*, the *ARCO Spirit*, the *Bay Ridge*, and the *Brooklyn*. On April 29, 1988, the U.S. District Court ruled that the Federal Government would have to give the subsidy repayments back to the shipowners and once again exclude them from domestic trade. The State of Alaska, the DOT, and ARCO filed an appeal to the District Court ruling, and in August 1989, the U.S. Court of Appeals, overturned the ruling by the Federal District Court judge, thus allowing the four tankers to continue transporting North Slope crude to the lower 48 States. The maritime unions and other shippers have not announced plans to appeal this ruling.

Crude Oil Pipelines

The great majority of crude oil produced in Alaska is derived from North Slope wells. This crude, together with limited amounts of natural gas liquids (NGL), is shipped south through the Alyeska Pipeline. Upon its arrival in Valdez, this crude is then transported by tanker to refineries on the west or gulf coasts of the United States via tankers. If the crude is delivered to the gulf coast, it is first moved by pipeline across the Isthmus of Panama.

Alyeska Pipeline

For more than 12 years, the Alyeska Pipeline, previously known as the Trans-Alaska Pipeline System (TAPS), has transported crude oil and natural gas liquids (NGL) nearly 800 miles from the producing wells of Alaska's North Slope fields south to the Port of Valdez. The majority of the crude oil and NGL transported by the Alyeska Pipeline emanates from the giant Prudhoe Bay field, the most productive oil field in U.S. history, but is supplemented by hydrocarbons from the Kuparuk, Endicott, Milne Point, and Lisburne fields. It is anticipated that any new production from either State or OCS discoveries will also be shipped south using the Alyeska Pipeline. As production from Prudhoe Bay declines, it is hoped that new discoveries will maintain the volume of crude from the North Slope that now provides up to 20 percent of the Nation's consumption.

All-American Pipeline/Pacific-Texas Pipeline

The majority of crude oil produced by wells located in Alaska is transported by tanker to refineries located on the west and gulf coasts of the United States. Tankers bound for the gulf coast must either traverse the Panama Canal or offload crude oil into the Panamanian Pipeline in order to reach their destinations. Because of the great distance between origination and destination of Alaskan crude, high transportation costs reduce the wellhead value of Alaskan crude oil. A new pipeline stretching from California to Texas may offer some relief to Alaskan producers.

The All-American Pipeline, owned and operated by the All-American Pipeline Co., currently stretches over 1,200 miles from Bakersfield, Calif., to McCamey, Tex. When complete, the pipeline will extend to Webster, Tex., near Houston. On December 7, 1987, the first crude reached McCamey, Tex. The 300,000-bpd, 30-inch pipeline, which is still considered to be in a test mode, has been transporting over 100,000 bpd. Currently, the All-American Pipeline has the excess capacity to accept some North Slope crude oil.

The Pacific-Texas (Pactex) Pipeline was originally proposed to transport Alaska North Slope and southern California crude oil to gulf coast refineries. This project included a proposed marine terminal in the Los Angeles Harbor, where tankers carrying North Slope crude could offload their cargo. However, on January 14, 1989, the Bureau of Land Management executed an adverse cancellation of the Pactex Pipeline Company's right-of-way grant for failure to pay the required rent. The status of this project is unclear at this time.

Natural Gas Pipelines

Within Alaska, most of the natural gas reserves are located on the North Slope, particularly within the Prudhoe Bay unit. The State of Alaska has estimated remaining proven recoverable reserves of natural gas on the North Slope to be approximately 31-32 Tcf. The current lack of ability to transport these reserves to markets in other parts of the United States, or to export markets, has prevented their development. During the 11 years of field development on the North Slope, two major proposals have been advanced to transport these natural gas resources. But, to date, no related construction has begun. Recent developments, however, bode well for the future of natural gas production from Alaska's North Slope (as indicated in the following discussion).

Alaska Natural Gas Transportation System

The need to develop and deliver to market the large volumes of natural gas to be found on Alaska's North Slope has long been recognized. In 1976, the U.S. Congress passed and the President signed the Alaska Natural Gas Transportation Act. This act approved of private industry construction of the Alaska Natural Gas Transportation System (ANGTS), also known as the Alaska Highway natural gas pipeline. The route of the ANGTS Project was approved by the President, and Congress ratified it in 1977.

As proposed, the ANGTS was composed of three legs which, when constructed, would connect the Alaska North Slope gas producers to markets in the U.S. West and Midwest. The ANGTS Project is composed of one Alaskan line and two Canadian lines. Portions of the southern routes are complete and have transported about 1.9 Tcf of Canadian natural gas to markets in Oregon and Iowa. Recent developments on the ANGTS Project are itemized below.

June 1988 - The sponsors of the ANGTS Project announced that technological advances and an improved economic climate allowed them to reduce the estimates of project completion costs from $26.1 billion to $14.6 billion.

November 1989 - Foothills Pipe Lines Ltd., the Canadian sponsor of the project, filed an application with Canada's National Energy Board to construct a 1.2 Bcfd Mackenzie Valley Pipeline to move gas from Canada's Mackenzie Delta. Foothills also announced that it will seek the necessary approval for the construction of a section of the ANGTS from Caroline, Alberta (about 83 miles northwest of Calgary) to Boundary Lake, to link the Mackenzie Valley Pipeline with existing portions of ANGTS. The 408-mile, 48-inch pipeline would be capable of transporting 1.2 Bcfd of Canadian gas, and with the addition of compression, 2.4 Bcfd of Alaska North Slope gas. (Petroleum Information, *Alaska Report*, Nov. 8, 1989.) Mackenzie Delta gas could move to market in the mid- to late 1990's, depending on market conditions in the United States and Canada. (*Oil & Gas Journal*, Nov. 6, 1989, p. 18.)

Trans-Alaska Gas System

The Yukon Pacific Corporation proposed in 1983 to build a buried, chilled, high pressure natural gas pipeline that would originate at Prudhoe Bay and run southward, generally along the route of the Alyeska Pipeline, nearly 800 miles to Valdez. As proposed, up to 2.3 Bcfd of natural gas reserves from the North Slope would be conditioned and transported through TAGS to a liquefaction plant and marine terminal located north of Valdez. Liquified natural gas (LNG) derived from this project would be exported via tanker to potential markets in Japan, Korea, and Taiwan, as well as markets on the U.S. west coast.

As reported in the previous Alaska Update, the Yukon Pacific Corporation was awaiting action from several Federal agencies on permit or project approval applications, including the Bureau of Land Management, the Army Corps of Engineers, the Forest Service, the Economic Regulatory Administration, and the Federal Energy Regulatory Commission. The Yukon Pacific Corporation was also working to (1) obtain purchase agreements with the countries that it proposes to export to, (2) obtain supply contracts, and (3) secure its sources of financing prior to begining construction. Yukon Pacific hopes to move Alaskan North Slope natural gas through the system by 1996. Recent developments related to the TAGS project are itemized below:

May 1988 - The Alaska's State DNR gave tentative approval to Yukon Pacific's application to lease State land along the proposed 800-mile route.

June 1988 - The Bureau of Land Management and the ACOE jointly issued the final EIS for the TAGS project. This document was prepared in cooperation with all interested and involved Federal and State agencies, and it analyzes construction and operation of the proposed TAGS, an alternate routing to Cook Inlet, and a no-action alternative.

October 17, 1988 - The DOI approved a Federal right-of-way grant for Yukon Pacific's proposed TAGS project.

November 16, 1989 - The DOE approved Yukon Pacific Pipeline's application to export up to 660 Bcf of Alaska natural gas to Japan, South Korea, and Taiwan.

Exportation of Alaskan Crude Oil

Crude oil production in Alaska occurs in two areas: (1) the North Slope, including the Prudhoe Bay field and (2) the Cook Inlet area (see table 3, p. 13). The exportation of Alaskan crude oil has been the topic of political debate for many years. Several laws preclude Alaskan crude oil from being exported. Among these laws are (1) Mineral Leasing Act of 1920, (2) the Export Administration Act of 1969, (3) the Trans-Alaska Pipeline Transportation Act of 1973 (due to expire on September 30, 1990), and (4) the Energy Policy and Conservation Act (EPCA) of 1975. The last law does provide the President with discretionary powers (sec. 103 (b)) to allow exemptions for the exportation of crude oil on the basis of national interest. Discussions of the exportation of natural gas produced in Alaska are still in the preliminary phases. The TAGS project, however, would provide a mechanism for the export of Alaskan natural gas (see discussion on TAGS above).

Cook Inlet Crude Oil

On October 24, 1985, President Reagan signed a Presidential Policy Directive on the basis of the recommendation of the Economic Policy Council to use his administrative authority to permit the export of Cook Inlet oil. The Secretary of Commerce subsequently made a finding, under section 103 of EPCA, that the export of Cook Inlet oil was in the Nation's interest. One year later, in December 1986, the

Chinese Petroleum Company of Taiwan became the successful bidder in the State of Alaska's first sale of Cook Inlet crude oil. State officials estimated they received about $2.4 million more from the export of this crude than if they had sold it within the United States. This was a 1-year contract with the Chinese Petroleum Company. The Chinese Petroleum Company has continued to be the successful bidder for the export rights of Cook Inlet crude oil. In 1988, the Company bid a premium of 52 cents per barrel above the standard per-barrel price, bringing the State about $600,000 in additional revenue. The 1988 contract, which took effect in December 1988, was for the purchase of 3,200 bpd of crude oil.

In 1989, three companies submitted bids to export Cook Inlet oil. Unocal, the low bidder, bid 6 cents, Tesoro Alaska Petroleum Company bid 7 cents, and the Chinese Petroleum Company, the high bidder, bid a premium of 17 cents per barrel above the standard per-barrel price. The State will receive approximatly $198,560 in additional revenue as a result of the 1989 contract. As was the case in past years, the contract is for 1 year, and the State will begin delivery in December 1989, selling about 3,200 bpd, or about 1.1 MMbbl for the year.

North Slope Crude Oil

Currently, the North Slope of Alaska produces about 1.9 MMbpd of crude oil (November 1989). As much as 2.1 MMbpd was produced in 1988. A very small amount of this crude is refined for local use on the North Slope. In addition, 111,000 bpd is refined at the North Pole refinery in Fairbanks, and the balance makes an 800-mile pipeline journey to the deep-water Port of Valdez, where it is offloaded onto tankers for various destinations. In November 1989, 1.73 MMbdp left Valdez, via 70 sailings. Approximately 20,000 bpd is transported from Valdez to Cook Inlet refineries for Alaskan consumption. Table 11 lists the destinations of Alaskan crude oil during calendar year 1988 and during September 1989 (Department of Energy, Dec. 1989) For further information contact:

Table 11. *States that receive Alaskan crude oil*

State/ Territory	September 1989	CY 1988 Total	CY 1988 (bpd)
California	25,094,000	290,154,000	794,942
Washington	11,885,000	144,113,000	394,830
Hawaii	1,436,000	19,905,000	54,534
Texas	3,775,000	60,072,000	164,581
Louisiana	931,000	52,598,000	144,104
Puerto Rico	0 *	798,000	2,186
Virgin Islands	616,000	45,801,000	125,482

* Refinery temporarily closed for modifications.
CY = calendar year
SOURCE: U.S. Department of Energy, personal communication, Nancy Masterson, December 1989.

U.S. Department of Energy
Energy Information Administration
Forrestal Building
Washington, DC 20585
(202) 586-1181 or (FTS) 252-1181

A 1985 amendment to the Export Administration Act mandated a study to examine the advantages and disadvantages of exporting Alaska's North Slope crude oil. The Department of Commerce chaired a multiagency task force that produced the study in May of 1986. The study indicated that removing the prohibition on exporting Alaskan crude oil could bring $10.2 billion to the United States during the next 13 years.

The opportunity for exporting Alaskan North Slope crude oil occurred with the signing of the U.S. Canadian Free Trade Agreement on December 9, 1987. A provision (Annex 902.5) was made under this agreement for the exemption of Canada from the prohibition of exporting Alaskan crude oil of up to 50,000 bpd, as long as this oil is first transported to a port in the lower 48 States. There is some question as to the constitutionality of this provision, which does not allow Congress to give preferential treatment of one State's port over that of another State's port. This question has not been officially resolved. The

Free Trade Agreement is an executive agreement and not a treaty; it therefore does not require ratification by the Senate. However, it does require that Congress pass implementing legislation. As of December 1989, this legislation had not been passed. In September 1989, Senator Riegle of Michigan and Chairman of the Senate Committee on Banking, Housing, and Urban Affairs, introduced a bill that would indefinitely extend the current export restrictions. Governor Cowper of Alaska sent a letter to the committee stating that the restriction was shortsighted and jeopardizes the Nation's energy security. Allowing the export of Alaskan oil would cut transportation costs in half, thereby providing an economic incentive to develop North Slope reserves. (Petroleum Information, *Alaska Report*, Sept. 27, 1989).

Onshore Support Facilities

The two areas of Alaska that currently have offshore operations are the Cook Inlet and the North Slope. The Cook Inlet is a mature province with few new reservoirs coming into production. The North Slope is a major oil and gas province. Up to 15 percent of U.S. consumption of oil is supplied by wells located in this area.

Most of the production from the Cook Inlet is used in local markets, with the exception of about 3,300 bpd of the State's royalty oil, which is dedicated to the export market (see related discussion on p. 46). Support activities for offshore operations are conducted from immediately adjacent areas such as Port Nikiski.

The majority of production from the North Slope is transported to the south coast port of Valdez via the Alyeska Pipeline and then on to U.S. west and gulf coast refineries. Support activities for most onshore North Slope wells is conducted in Deadhorse. For OCS exploratory efforts, support requirements vary. Because of demanding logistic considerations, many of the newer wells have been largely self supporting with backup provided by nearby areas having airstrips. Table 12 provides a list of the actual or potential Alaska OCS Region support facilities.

Refineries

There are six refineries in the State of Alaska. Two of these refineries are located on the North Slope and serve only local needs. Two of the remaining refineries are located at North Pole, and two are at Kenai. At the beginning of 1989, these six refineries had a capacity of 217 Mbpcd (*Oil & Gas Journal*, March 20, 1989, p. 72.). The feedstock for these refineries is all derived from both onshore and offshore State leases and onshore Federal leases. Substantially more oil is produced in Alaska than can be refined there at present; the remaining production is transported to refineries on the west and gulf coasts of the United States.

Proposed APRI Refinery in Valdez

In 1986, Alaska Pacific Refining, Inc. (APRI) was formed to construct a $750-million, 100-Mbpd refinery at Valdez. Feedstock for the refinery is to be derived from the Alyeska Pipeline and production is destined for export to foreign markets. Only the exportation of crude oil, and not refined products, is prohibited by law. If completed, the APRI refinery would be the first U.S. refinery dedicated to the export market.

In January 1987, the Valdez City Council approved the leasing of more than 1,500 acres of land to APRI for their facility. Following this, APRI was dealt a temporary setback when a Congressional trade bill was introduced that sought to restrict the amount of refined product that could be exported from Alaska. This bill was later vetoed by the President for inclusion of this restriction, as well as for unrelated reasons. APRI is now in the process of obtaining funding for this project. If funding can be arranged,

Table 12. *Actual or potential Alaska OCS Region support facilities*

Name of facility	Type of service/ support	Planning area serviced	Description of facility
Deadhorse Airport ARCO Airport	Airport	Arctic Subregion	6,500-ft paved airstrip, 5,500-ft gravel airstrip
West Dock East Dock Prudhoe Bay	Port	Arctic Subregion	Limited harbor facilities available late July to early September for use during approximately 6-week ice-free season for sealifts. West Dock--1.5-mile gravel causeway; East Dock--shallow-water dock onshore
Oliktok Point Kuparuk	Port	Arctic Subregion	Limited harbor facilities
Dutch Harbor	Port	Bering Sea Subregion	Ice-free, deep-water, natural anchorage
Unalaska City Airport	Airport	Bering Sea Subregion	4,000-ft airport runway being extended by 2,000 ft
Cold Bay Airport	Airport	Bering Sea Subregion	2 paved runways -- 5,162 ft and 10,415 ft
Nome Harbor	Port	Bering Sea Subregion	Plans for a 3,600-ft gravel causeway dock with 27-ft draft capabilities; existing lighterage operations only. Existing causeway is 2,600 ft
Nome Airport	Airport	Bering Sea Subregion	6,039-ft paved airstrip, 5,610-ft paved airstrip
Nome City Airport	Airport	Bering Sea Subregion	3,200-ft gravel airstrip
St. Paul Island Airport	Airport	Bering Sea Subregion	5,175-ft gravel airstrip
Unalakleet	Airport	Bering Sea Subregion	6,567-ft gravel airstrip
Moses Point	Airport	Bering Sea Subregion	4,653-ft gravel airstrip
Gambell on St. Lawrence Island	Airport	Bering Sea Subregion	4,251-ft gravel airstrip
Yakutat Airport	Airport	Gulf of Alaska Subregion	3,600 acres, with two helicopter hangar facilities 2 paved runways -- 7,748 ft and 7,813 ft
Yakutat/Monti Bay Harbor	Port	Gulf of Alaska Subregion	115-ft pier for workboats, deep water
Kenai Harbor	Port	Gulf of Alaska Subregion	Rig tenders deep-water dock at Nikiski (10 miles north of Kenai)
Homer Harbor	Port	Gulf of Alaska Subregion	City-owned deep-water dock on Homer spit
Homer Airport	Airport	Gulf of Alaska Subregion	7,400-ft paved airstrip
Kodiak Harbor	Port	Gulf of Alaska Subregion	Channel: minimum 22-ft MLLW* depth, 200-ft width; breakwaters: 1,250 and 760 ft long
Port Lions/ Kodiak Airport	Airport	Gulf of Alaska Subregion	2,600-ft gravel airstrip adjacent to U.S. Coast Guard base airfield. Main airport has 3 paved runways -- 7,548 ft, 5,398 ft and 5,011 ft
Seward Airport	Airport	Gulf of Alaska Subregion	4,600-ft paved airstrip
Seward Harbor	Port	Gulf of Alaska Subregion	Channel: minimum 15-ft MLLW* depth, 120-ft width; breakwaters: 2 rock mounds 1,060 and 1,750 ft long, with provision for further basin expansion

*MLLW = Mean lower low water, which is the lower of two low tides of unequal height occurring each tidal period of 24 hours, 40 minutes.

APRI estimates that construction may begin in the fall of 1991.

Gas Processing Facilities

At the beginning of 1989, the State of Alaska had three gas processing plants. Two of these plants are located on the Kenai Peninsula and process gas produced from the Cook Inlet and surrounding areas. The remaining plant is located at Prudhoe Bay; this plant processes more that 99 percent of the gas treated in Alaska. With the exception of 40-50 Mbpd of NGL, most of the gas processed is used locally or used to enhance oil production from the Prudhoe Bay field.

The Prudhoe Central Gas Facility, which is the world's largest gas processing plant, began full operations in 1987. The facility currently has a capacity of more than 3.3 Bcfd. During the summer of 1988, the operators of the Central Gas Facility announced plans to upgrade the gas processing plant at Prudhoe. This upgrade project, which will cost a estimated $350 million to complete, will boost gas processing capacity at Prudhoe to more than 5 Bcfd. Construction of various pipeline systems and rebuilding of the processing modules began in late 1989. If construction proceeds according to schedule, the project should be completed by the fall of 1990.

Construction Facilities

Most of the construction related to oil and gas development in Alaska occurs outside of the State because of the current lack of suitable facilities. Modules constructed for delivery to North Slope development projects in the past have come from the U.S. gulf coast, Oregon, Washington, and from Asian countries. These modules are then transported by barge to Prudhoe Bay during the open-water season or, if smaller, are trucked to the North Slope on the gravel haul road. (Refer to the Arctic Sealift discussion on p. 43 for more information.)

To encourage local construction, the Port of Anchorage recently initiated efforts to develop a 5-acre module construction site. The Port's initial plans focus on smaller modules that can be constructed in Anchorage and then trucked to the North Slope. On October 11, 1989, Petroleum Information announced in their *Alaska Report* that ARCO Alaska awarded a contract for the construction of two drillsite manifold-expansion modules to Anchorage-based Alaska Petroleum Contractors, Inc. This contract, valued at approximately $1 million, will represent the first time such modules, destined for the Prudhoe Bay field, have been contructed within the State. The modules are expected to be completed by December 1989. ARCO plans to build a total of eight such modules over the next 2 years.

Additional Readings

Bureau of Land Management and U.S. Army Corps of Engineers. June 1988. *Final environmental impact statement for the proposed Trans-Alaska gas system.* Rept. No. BLM-AK-PT-88-003-1792-910: 632 p., plus appendixes.

4. Issues Related to OCS Activities

Alaska Coastal Zone Management Program

The Alaska Coastal Management Program (ACMP) was approved by the Secretary of Commerce in 1979. With this approval, the State of Alaska obtained the right to review, for purposes of consistency with the ACMP, all plans of exploration or development and production covering proposed activities on the OCS. The Division of Governmental Coordination within the Governor's Office of Management and Budget coordinates these consistency determinations as well as other Federal consistency determinations and State determinations requiring multiple permits. These determinations are supported by responses from the State resources agencies and the affected local districts that have approved programs.

The ACMP sets general standards and guidelines for local governments and for elected regional coastal resource service area boards, in unorganized areas of the State, to follow in preparing district coastal management programs for their jurisdictions. After a resource inventory is prepared, public hearings are conducted, and local conceptual approval is given to the draft district coastal management plan. The plan is then submitted to the Alaska Coastal Policy Council (CPC) for review and approval. When the CPC approves a district plan, it is submitted to the Secretary of Commerce for review as a modification or amendment to the ACMP. Once Secretarial approval is received, the plan is filed with the Alaska Lieutenant Governor and also sent back to the district for adoption by ordinance, at which point it becomes effective. Currently, the CPC is developing regulations to process petitions that have been submitted by aggrieved parties.

The State of Alaska determined that an exploration plan submitted by Amoco Production Company for the Galahad Prospect was not consistent with the North Slope Borough district policies or the Statewide standards of the ACMP. The State disagreed with the proposed monitoring program that would be implemented during the bowhead whale migration. On April 3, 1989, Amoco filed a notice of appeal with the Secretary of Commerce. The record on the appeal closed on October 13, 1989. A final decision, which will be published in the *Federal Register*, is anticipated in the spring of 1990. (See ch. 2, p. 26, for more information on the Galahad Prospect).

District plans are used by local and State planners to guide development that occurs in, or that directly affects, the coastal zone in their jurisdictions. Table 13 summarizes the status of the district programs of the ACMP.

Distribution of Section 8(g) Funds

With the amendments to the OCS Lands Act in 1978, the U.S. Congress established a buffer zone on the federally controlled OCS adjacent to State controlled portions of U.S. offshore submerged lands in order to compensate the coastal States for the possibility of transboundary oil and gas resources. The 8(g) zone, named after the provision of the OCS Lands Act that established it, extends 3 nautical miles seaward of the State-Federal offshore boundary.

As amended in April 1986, section 8(g) of the OCS Lands Act (43 U.S.C. 1337 (g)) provided that 27 percent of the escrowed bonuses, rents, and royalties derived between September 1978 and October 1986

51

Table 13. *Status of district programs of the Alaska Coastal Zone Management Program*

District	Program effective date or status
A. Approved programs that make up the ACMP:	
Aleutians East Borough	May 1, 1989 (submitted October 30, 1985)
Municipality of Anchorage (amended)	June 22, 1981 (originally approved in 1980)
Annette Island Indian Reserve	*
City of Bethel	January 3, 1984
Bristol Bay Borough	January 3, 1984
Bristol Bay CRSA	February 17, 1987
Cenaliulriit CRSA	March 11, 1985
City of Cordova (amended)	November 24, 1986 (originally approved in 1981)
City of Craig	May 31, 1985
City of Haines	October 22, 1980
City of Hoonah	November 1, 1984
City of Hydaburg	May 21, 1984
City and Borough of Juneau	November 25, 1986
City of Kake	May 31, 1985
Ketchikan Gateway Borough	May 1, 1984
City of Klawock	May 31, 1985
Kodiak Island Borough	March 15, 1984
Matanuska-Susitna Borough (amended)	October 17, 1988 (originally approved June 8, 1984)
City of Nome	March 15, 1984
North Slope Borough	May 6, 1988
City of Pelican	October 15, 1984
City and Borough of Sitka (amended)	May 31, 1989 (originally approved in 1982)
City of Skagway (amended)	August 19, 1983; amendment pending 1989
City of St. Paul	January 13, 1989
City of Valdez	February 4, 1987
City of Yakutat	February 24, 1982
B. Areas meriting special attention (AMSA) outside districts:	
Southern Southeast AMSA's	October 7, 1983
Eyak Lake AMSA	November 24, 1986
C. District programs not yet in effect:	
1. State and locally approved district program awaiting Federal approval:	
Northwest Arctic Borough	December 22, 1989
Bering Straits CRSA	December 22, 1989 final decision due December 1989
City of Whittier	Public hearing draft review by January 1989; approved September 26, 1989 by Alaska State Coastal Policy Council
2. Status of remaining districts:	
City of Angoon	Public hearing draft review through September 1988; pending approval of the Alaska State Coastal Policy Council; expected early 1990
Kenai Peninsula Borough	Public hearing draft review through October 1988; pending approval of the Alaska State Coastal Policy Council; expected early 1990
Aleutians West CRSA	Newly designated district; public hearing draft in preparation
City of Thorne Bay	Newly designated district

*State and Federal consistency do not apply because of the special legal status of the reserve.

SOURCE: State of Alaska, Office of Management and Budget, Division of Governmental Coordination (October 3, 1989) from Federal OCS leases in the 8(g) zone be distributed to the seven coastal States adjacent to those leases. In addition, section 8(g) requires the MMS to make monthly payments to these same States on the basis of current revenues from the 8(g) zone. With the enactment of the legislation, Congress indicated that the settlement would "provide affected coastal States and localities with funds that may be used for the mitigation of adverse economic and environmental effects related to the development of such resources . . . ."

According to the legislation that established section 8(g), the coastal States affected also will receive an additional $650 million over a 15-year period: 3 percent for the first 5 years; 7 percent for the next 5 years; and 10 percent for the last 5 years. More than $66 million has been disbursed by MMS to Alaska, including the initial settlement distribution from the escrow account, the first installment payment, and monthly payments through fiscal year 1989.

Arctic National Wildlife Refuge

The Arctic National Wildlife Refuge (ANWR) is a coastal area of 8.9 million acres (1.5 million acres are a coastal plain) bordering with Canada on its eastern side, the Beaufort Sea on the northern side, and the Canning River on the western side. The wildlife refuge is considered the last U.S. onshore location with the potential for oil finds as large as the Prudhoe Bay fields.

The *Exxon Valdez* oil spill in March 1989 has resulted in an indefinite delay in congressional action necessary to open up the refuge to oil exploration. The numerous bills in Congress, either promoting or opposing the opening of ANWR to oil and gas activities, are still circulating. These bills represent the full scope of possibilities from maintaining a pristine wilderness to short-term, focused exploration programs that earmark funds for the acquisition and maintenance of national wildlife refuges, to full-scale leasing of the coastal plain portion of the refuge. It is not possible at this time to know what form, if any, an ANWR leasing program might take.

Although the DOI announced a 1-year delay until August 1991 of a proposed offshore lease sale for the Gulf of Alaska and the Cook Inlet, the DOI indicated that this did not diminish the Administration's commitment to a separate plan for oil and gas exploration in ANWR. Under the Reagan Administration, the DOI decreed in April 1987 that the area held "the Nation's best single opportunity to increase significantly domestic oil production over the next 40 years," and recommended to Congress that the Arctic Refuge coastal plain be opened to full oil and gas leasing.

The previous *Alaska Update* (MMS 88-0073) described the land exchange proposals with various Native American groups involving ANWR. In November 1989, the General Accounting Office (GAO) issued a recommendation that Congress order the DOI to write guidelines on land trades in Alaska to ensure that future exchanges with Native corporations do not shortchange Federal taxpayers. The recommendation came from a review of the 1983 land trade in which the Arctic Slope Regional Corporation traded property valued at $5.1 million for oil rights in the ANWR estimated to be worth $395.5 million. Six additional negotiated land deals with Native corporations were blocked 2 years ago because legislation was enacted requiring congressional approval, which was not needed in 1983. The GAO report said that the DOI discounted the value of the refuge property that was traded to the corporation.

In August 1988, section 201 of Public Law 100-395 prohibited the Secretary of the Interior from conveying interests in land within the ANWR coastal plain without congressional approval. In September 1988, GAO issued a report that was requested by congressional representatives entitled *Consideration of Proposed Alaska Land Exchanges Should be Discontinued* (GAO/RCED-88-179). The principal findings of the report are that the Secretary of the Interior should discontinue proposed land exchanges and that, if the Secretary of the Interior proceeds and presents the proposals to Congress, Congress should disapprove them. The primary reasons GAO felt the exchanges were not in the best interest of the Federal Government were (1) most of the lands that would be acquired were of limited wildlife and habitat protection benefits and (2) the prices DOI negotiated are six times their appraised fair-market values. The DOI strongly disagreed with GAO's findings, claiming the GAO conclusions were the result of oversimplification and misunderstanding of numerous complex issues relating to the proposed exchanges. These issues include (1) the management problems inherent in 20 million acres of Alaskan Native inholdings in Federal wildlife refuges in Alaska, (2) Congress's past decision to withhold condemnation authority from the DOI while providing detailed exchange authority for these inholdings, and (3) the unique opportunity for exchange limited subsurface interests on the ANWR coastal plain for title to 891,000 acres of Native holdings. The report cited above confirms both the DOI's comments on the report as well as the GAO response.

Economic Limit Factor

The economic limit factor (ELF) is a State of Alaska graduated severance tax that reduces the tax as oil well production rates decline. It was adopted in 1977 to provide incentives for continued production on marginally economic fields, changing the tax rate that would otherwise be called for by the Alaska Oil and Gas Properties Production Tax. Under the ELF more productive wells pay higher taxes, while less productive wells pay less taxes, allowing them to produce more oil.

During the first week of May 1989, in the aftermath of the *Exxon Valdez* oil spill, the Alaska State Senate passed legislation revoking the tax relief ELF. Governor Cowper signed the measure within 3 hours of its passage. The oil industry was opposed to the elimination of ELF and indicated that this change in the tax law would make many fields uneconomic and would discourage new exploration and enhanced-recovery projects, resulting in the oil remaining in the ground. In fact, the oil industry claims that in response to these changes in the tax laws, several major projects have been canceled or postponed. These projects are (1) the $85-million BP Hurl State development project at Prudhoe, (2) the $58 million earmarked for the $2-billion ARCO West Sak Project, (3) the cancellation by ARCO of a Kuparak drilling rig, and (4) the possible cancellation of the ARCO development of the Point McIntyre discovery.

Control of Offshore Drilling Wastes

Exploration for and the development and production of oil and gas, both onshore and offshore, generate various waste streams. The Federal Government is responsible for regulating these waste streams and thereby protecting public resources and health. Discharge of wastes from oil and gas facilities on the OCS is regulated by the Environmental Protection Agency (EPA) through its National Pollutant Discharge Elimination System (NPDES) permits. Both the NPDES and hazardous wastes issues are discussed in more detail below.

National Pollutant Discharge Elimination System

All discharges from oil and gas exploration, development, and production facilities on the OCS are regulated by the EPA under the terms of its NPDES general permit. This permit establishes relevant effluent limitations, prohibitions, reporting requirements, and other conditions.

On September 27, 1989, the EPA issued final modifications on NPDES general permit for oil and gas operations on the OCS and in State waters of Alaska and the Beaufort Sea (54 FR 39574). The original NPDES permit was issued June 7, 1984, and expired May 30, 1989 (Permit No. AKG284000, 49 FR 23734). A Beaufort Sea permit (AKG284100) was published in the *Federal Register* September 28, 1988 (53 FR 37846), and covered the area of MMS Lease Sale 97. The EPA has modified the Beaufort Sea permit to include all areas of the original permit: MMS Lease Sales 71 and 87; the State of Alaska Lease Sales 36, 39, 43, 43A; and MMS-State Lease Sale BF, and the contiguous onshore State lease sales. The modified general permit also includes a prohibition on discharges within 1,000 meters of river mouths or deltas during unstable or broken-ice conditions or open-water conditions. For further information on the NPDES Program, contact the office listed below. Region 10 of the EPA administers the NPDES for the Alaska OCS.

Environmental Protection Agency-Region 10
Ocean Programs Section
1200 Sixth Ave.
Seattle, WA 98101
(206) 442-2110

Resource Conservation and Recovery Act

When Congress passed the Resource Conservation and Recovery Act (RCRA), it temporarily exempted drilling fluids, produced waters, and other wastes associated with exploration, development, and production of oil, gas, and geothermal energy. The EPA was, however, directed to study the adverse effects of these wastes on human health and the environment and report back to Congress on whether or not these wastes should be regulated under RCRA as hazardous (42 U.S.C. 6982(m)).

On January 4, 1988, the EPA published a notice of availability of this report and of public hearings on the report (53 FR 81). In this report, EPA reported to Congress that the wastes from the oil and gas and geothermal industries were regulated sufficiently to protect human health and the environment and did not merit full regulation as hazardous wastes. On July 6, 1988, the EPA published a regulatory determination (53 FR 25446) stating that these wastes would not be regulated as hazardous wastes. Rather, the EPA would implement a strategy to address the diverse environmental and programmatic issues that these wastes pose (1) by improving Federal programs under existing authorities in Subtitle D of RCRA, the Clean Water Act, and Safe Drinking Water Act; (2) by working with States to encourage changes in their regulations and enforcement to improve some programs; and (3) by working with Congress to develop any additional statutory authorities that may be required. Further information on this subject can be found in the EPA report cited in the "Additional Readings" section of this chapter or by calling the RCRA/Superfund Hotline (800) 424-9346.

Additional Readings

The National Response Team. *A report on the national oil and hazardous substances response system.* Annual Report, Environmental Protection Agency, March 1989: Washington, D.C.: 66 p.

The Commonwealth North ANWR Committee. *An Alaskan View of ANWR.* April 1989, 36 p.

BLANK PAGE

Appendix A: Exxon Valdez Oil Spill in the Prince William Sound, Alaska

Chronology of Spill Events

The chronology of spill events that follows was compiled from information extracted from Coast Guard reports, statements from the Alyeska Pipeline Service Company presented to the Alaska Oil Spill Commission August 31, 1989, numerous newspaper clips, information from the MMS Alaska Region, the OCS Policy Committee meeting held April 18-19, 1989, personal communications, and other sources. Table 14 summarizes the actions taken by the major parties involved in the *Exxon Valdez* spill. Figure 10 shows the coastal areas contacted by the oil.

March 23, 1989. At 9:00 p.m., the oil tanker *Exxon Valdez* left the Valdez terminal fully loaded with crude oil headed for Long Beach, Calif. After the tanker passed through the Valdez Narrows without incident, the Coast Guard gave the vessel operators permission to make several course changes to avoid floating ice calved from the Columbia Glacier.

March 24, 1989. At 12:04 a.m., the oil tanker *Exxon Valdez* collided with Bligh Reef in the Prince William Sound, Alaska. Bligh Reef is located outside the normal shipping lane, about 13 miles south of Valdez Narrows. The 987-foot, single-skin vessel (166 feet wide) was loaded with 1,264,155 bbl (53,094,510 gal) of Alaska North Slope crude oil. At the time of the grounding, it was loaded to a draft of 56 feet. Eight of the eleven oil cargo tanks, as well as three saltwater ballast tanks, ruptured.

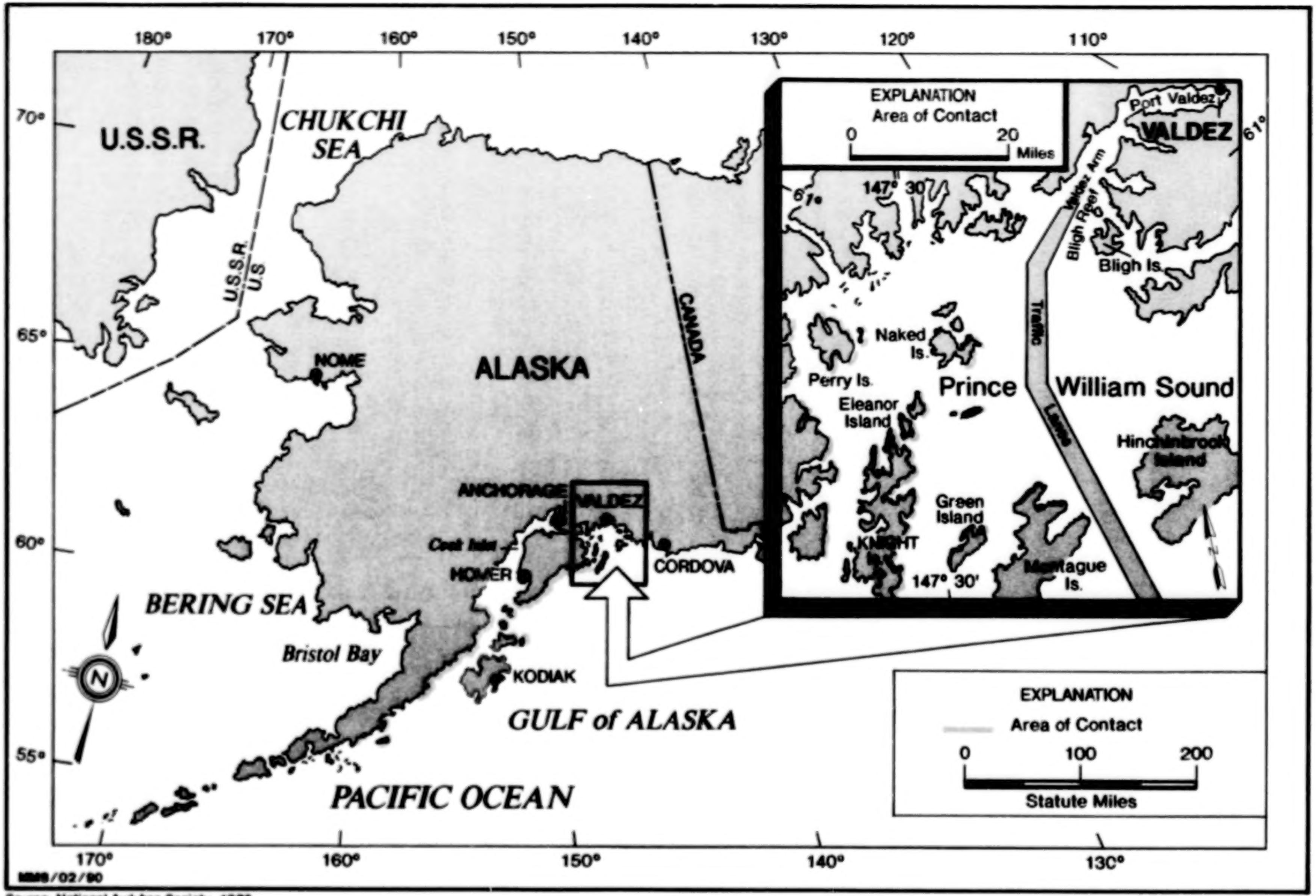
March 24, 1989. At 12:28 a.m., the Coast Guard received notification from the *Exxon Valdez* that the vessel was hard aground on Bligh Reef. The vessel was maneuvering to avoid glacial ice, and had left the sea lanes.

March 24, 1989. At 12:30 a.m., the Coast Guard closed the Port of Valdez. The Port remained closed to all traffic for 4 days. Within the first 20-30 minutes, 115,000 bbl of oil were lost; by 3:23 a.m., 138,000 bbl were lost; by 5:30 a.m., 242,000 bbl were lost. At 7:27 a.m., the Alyeska Pipeline Service Company (Alyeska), had a helicopter aloft with a Coast Guard investigator. The first aerial surveillance was made and indicated a surface slick of 1,000 feet wide and 4-5 miles long. The total spill volume was estimated at 11 MMgal or 260,000 bbl (other estimates list 240,000 bbl), making it the largest oil spill in U.S. history.

March 24, 1989. At 2:49 a.m., the Coast Guard Pacific Strike Team was called for assistance. The Strike Team is home-based at the Hamilton Air Force Base in San Rafael, Calif. The team is called in when requested by the local Coast Guard commander or the EPA and generally only when there are unusual circumstances or the spill turns out to be severe. The Strike Team's role is not to actually clean up the spill but to oversee and monitor the cleanup operation. Alyeska, which was responsible for cleaning up any North Slope crude oil spilled along the Trans-Alaska Pipeline route or in the Valdez port area and nearby Prince William Sound, reached the spill site with cleanup crews 14 hours after the spill occurred. An oil-spill cleanup barge stripped of its equipment was in the shipyard. Alyeska did not have a tank barge available to receive recovered oil.

Table 14. Exxon Valdez *oil spill appendix - summary matrix*

	ACTIONS							
Organization	Direct Cleanup Involvement	Studies/ Spill Monitoring	New Operating Procedures	New Regulations	New Cleanup Requirements/ Facilities	Legislation	Investigation	Litigation
Exxon Corporation	X	X	X		X			X
Alyeska Pipeline Service Company	X		X	X	X		X	X
Coast Guard (Transportation Department)	X	X	X	X	X		X	
National Oceanic and Atmospheric Administration (Commerce Department)	X	X						
Environmental Protection Agency	X	X					X	
American Petroleum Institute		X	X		X			
Congress		X				X	X	
Alaska Department of Environmental Conservation	X	X		X	X			X
State of Alaska		X		X	X		X	X
Department of the Interior		X	X	X	X			
National Transportation Safety Board							X	
Fishermen Organizations	X							X
Alaska Oil Companies			X		X			
Environmental Groups		X						X
Local Communities	X	X						
Local Citizens	X	X						



Source: National Audubon Society, 1989

Figure 10. *Areas of contact of oil spilled from the* Exxon Valdez.

Alyeska, which has responsibility for the initial response to the oil spill, began mobilizing immediately. The spill occurred very quickly, at night, and in winter conditions with snow on the ground and ice in the water. Within the the first 5 hours of the spill approximately 11 MMgal of crude oil had spilled.

March 24, 1989. According to Coast Guard Lieutenant Commander Hollingsworth (April 19, 1989, at the OCS Policy Committee meeting), at approximately noon, Exxon Corporation relieved Alyeska of financial and logistical responsibility for the spill. Exxon and the Federal Government deployed considerable equipment to deal with the spill. At that point, the Coast Guard had 9 cutters, 8 aircraft, and approximately 1,000 personnel on site in Valdez. There were an additional 500 employees from other Federal agencies. The Department of Defense supplied and moved military and commercial equipment to the site. The Navy delivered 22 skimmers and 35,000 feet of Navy and Coast Guard oil-spill boom. Exxon contracted for 290 vessels and 25 aircraft. Forty-six skimming systems were operating in the Prince William Sound and 5 in the Gulf of Alaska. Exxon had deployed 1,700 personnel in Valdez. Hollingsworth indicated that there were three phases to the cleanup operation:

(1) the first phase was to eliminate the threat of additional pollution. Approximately 43 MMgal of crude oil remained on the vessel. Three ships were used to unload the remaining oil. This was completed on April 4, 1989.

(2) the second phase of the cleanup was to protect sensitive areas of the Prince William Sound. Fish hatcheries were boomed and monitored.

(3) the third phase was to actually cleanup the spilled oil. Skimmers and vacuum devices were used primarily, and burning and dispersants were used on a very limited test basis.

The first containment boom was deployed in mid-afternoon, more than 12 hours after the spill. At 3:10 p.m., the On-Scene Coordinator gave permission to conduct a limited dispersant test. At 6:00 p.m., the test was conducted and deemed ineffective because of minimal wave action.

At 6:20 p.m., the Pacific Strike Team arrived in Cordova from San Rafael, Calif. At 10:15 p.m., the first oil transfer hoses were connected from the *Exxon Valdez* to the *Exxon Baton Rouge*. Equipment problems prevented any oil transfer until 2 days later.

The National Transportation Safety Board (NTSB) began an investigation into the accident. Exxon attempted to burn the oil on the water. Fireproof booms were used and approximately 15 Mgal of oil were burned.

March 25, 1989. Personnel from the International Bird Rescue Center arrived and set up a bird-cleaning and rehabilitation station in Valdez. Sea otter facilities were set up in Homer and Seward, Alaska, by people from Hubbs Sea World in San Diego, Calif.

March 27, 1989. A spring storm spread the oil onto beaches.

March 28, 1989. The State of Alaska opened an investigation into the spill. President Bush sent representatives from the Environmental Protection Agency (EPA), U.S. Coast Guard, and Department of Transportation to survey the spill.

March 29, 1989. Bird collection began, supervised by the Fish and Wildlife Service. Cordova fishermen deployed containment booms across bay mouths where salmon fry would soon be seeking open ocean. The salmon hatchery at Port San Juan was successfully protected. Two fishermen filed a class action suit in Anchorage Superior Court, charging Exxon with gross negligence.

March 30, 1989. The NTSB announced that the captain of the *Exxon Valdez*, Joseph Hazelwood, had a blood alcohol level of

0.06 percent. Exxon fired Captain Hazelwood.

April 1, 1989. The State of Alaska filed charges against Hazelwood. The charges were (1) operating a ship while under the influence of alcohol, (2) reckless endangerment, and (3) negligent discharge of oil. Governor Cowper threatened to close the Trans-Alaska Pipeline unless the oil companies developed better oil-spill contingency plans.

April 2, 1989. The Alaska Department of Fish and Game closed the Prince William Sound herring roe fisheries.

April 3, 1989. Tanker traffic in the Valdez area resumed on a 24-hour basis. Herring season in the Prince William Sound was canceled.

April 5, 1989. After the oil was transferred to another vessel, the *Exxon Valdez* was refloated and moved to Naked Island, Alaska, for temporary repairs.

April 6, 1989. Oil companies announced improvements in safety procedures at the Valdez terminal. These improvements included (1) random testing for drugs and alcohol, (2) maintaining more cleanup equipment, and (3) asking the Coast Guard to expand radar navigation coverage in the Sound.

April 7, 1989. President Bush approved military assistance for the spill. Spilled oil was first reported in the Gulf of Alaska. Exxon reported that 500,000 gal of oil had been recovered, representing 5 percent of the total oil spilled.

April 13, 1989. Exxon temporarily suspended its cleanup operations while it developed a comprehensive shoreline cleanup plan for approval by the Federal On-Scene Coordinator. Approval was granted on April 17, 1989. Exxon reported that 840,000 gal of spilled oil had been recovered, which was less than 10 percent of the total oil spilled.

April 14-17, 1989. Oil slicks reached Cook Inlet, Shelikof Strait, Katmai National Park, Kodiak, and Alaska Peninsula.

April 15, 1989. The herring season in Lower Cook Inlet was canceled.

April 19, 1989. The Soviet skimmer, the 425-foot *Vaydaghubsky*, arrived in Seward. The vessel is one of the most advanced and largest oil recovery devices in the world with a capacity of 4,760 bph.

May 8, 1989. The first congressional hearing on the spill was held in Valdez.

May 9, 1989. The *Vaydaghubsky* quits, after only limited success due to the clogging of the ship's pumps by the very heavy, viscous oil. The ship collected approximately 80,000 gal of oil in 3 weeks.

May 16-20, 1989. The National Transportation Safety Board hearings were held in Anchorage.

May 22, 1989. An Anchorage grand jury indicted Captain Hazelwood on three felony counts of criminal mischief.

June 12, 1989. Hazelwood pleaded "not guilty" to the felony charges, and asked that the trial be moved from Valdez to Anchorage.

June 23, 1989. The *Exxon Valdez* left Prince William Sound and headed for repair docks in California. The vessel was required to remain at least 100 miles offshore during the transit.

July 6, 1989. The State of Alaska Department of Fish and Game canceled the opening of the salmon fishing season in the southern part of the Cook Inlet after tar balls were discovered in the area. More than 800 fishermen were affected. In response Exxon began issuing $10,000 checks to the affected fishermen. Exxon said that up to $6 million would be offered as such compensation, and acceptance of these checks did not preclude future litigation or claims from the fishermen or imply any liability on Exxon's part.

July 7, 1989. Spilled oil from the *Exxon Valdez* contacted a third national park area. The three areas contacted were (1) Aniakchak National Preserve (on the Alaska Peninsula), (2) Kenai Fjords National Park (on the Kenai Peninsula), and (3) Katmai National Park (on the Alaska Peninsula).

July 14, 1989. The California Attorney General's office filed a lawsuit in San Diego Superior Court against Exxon Corporation. The action would bring a temporary injunction preventing the *Exxon Valdez* from entering California waters until the State was assured that no pollution and harm would occur. The ship was maintaining a position 50 miles from the coast. Exxon had already agreed not to enter State waters until given permission by the State.

July 19, 1989. The Upper Cook Inlet drift-net fishing season was canceled.

July 21, 1989. To date, approximately 16,000 tons of solid wastes have been recovered. Of these, 13,000 tons were sent to a hazardous waste site in Oregon for disposal, and another 1,000 tons have been burned. Exxon expects a total of 40,000 tons of solid wastes will be collected and will need to be disposed. Exxon hoped to get Government approval to burn more of the wastes.

July 30, 1989. The *Exxon Valdez* entered San Diego Bay for repairs. It was towed 2,200 miles from Prince William Sound. The vessel had arrived in the San Diego area on July 10, 1989, but was not allowed to enter the port because small oil slicks were spotted near the vessel during the transit, including an 18-mile oil slick. Lab tests indicated that there was a 95-percent chance that the slick was Alaska North Slope crude oil, the oil that was spilled in Alaska. State of California officials insisted that there be no oil leaking from the vessel and that Exxon post a $20-million bond in case any more oil was spilled, before allowing passage into the port. Salvage work to remove shredded steel hull plates was accomplished offshore near San Clemente Island. The ship was then allowed to proceed with oil-spill cleanup vessels, numerous Coast Guard escort vessels, and environmental protest boats accompanying it to the National Steel and Shipbuilding Company (Nassco) dock where it was launched in 1986. The repairs were estimated to take 9 months and 3,000 tons of steel.

August 15, 1989. The State of Alaska filed a lawsuit against Exxon and the six other member companies of the Alyeska Pipeline Service Company. The suit was filed in Anchorage State Superior Court, and charged that the public was grossly deceived about the industry's ability to move crude oil safely and to clean it up if spilled. The suit also claimed "intentional and negligent" actions before and after the oil spill.

August 17, 1989. The National Wildlife Federation, the Wildlife Federation of Alaska, and the Natural Resource Defense Council filed a lawsuit against Exxon Corporation and the Alyeska Pipeline Company, charging that they should be responsible for financing the cleanup and restoration of the environment through an independently supervised trust fund. The suit also seeks punitive damages for fraud and misrepresentation in the industry's claims of ability to react to and clean up an oil spill.

August 21, 1989. The volume of oil-spill debris and waste material was estimated by Exxon to be 40,000 tons, of which 40 percent was weathered crude oil, 40 percent was oil soaked plastic absorbant material, gravel, logs, and dead animals, and 20 percent was seawater. Exxon brought in an incineration barge to burn the waste material, but withdrew it when it could not get State approval.

August 21, 1989. Exxon announced that it would keep a small strike force in the

Prince William Sound through the winter months to guard fish hatcheries and to monitor the effects of the winter weather on the oiled areas. The force would include about 20 workers, 4 ocean-going vessels 150 feet long, and 7 aircraft. The State indicated that it was encouraged, but thought the force was inadequate. In addition to the force, Exxon would leave a staff of 280, mostly in Anchorage, to process claims and analyze spill data.

August 23, 1989. Nine environmental groups announced that they had filed a lawsuit against Exxon, requiring that the oil-spill cleanup be continued through the fall and winter. The organizations included the Sierra Club, the Natural Resource Defense Council, the Prince William Sound Conservation Alliance, the Alaska Center for the Environment, the Defenders of Wildlife, Greenpeace USA, the Trustees for Alaska, the National Audubon Society, and the Northern Alaska Environmental Center.

September 1989. Exxon indicated that it had successfully used Inipol, a fertilizer that promotes naturally occurring microbes/bacteria that eat oil. Exxon sprayed 70 miles of beach and reapplied Inipol several times.

September 15, 1989. Exxon announced the pullout of cleanup crews, as planned, ending the 6-month cleanup effort. At the peak of the effort, Exxon employed cleanup crews of over 11,500 people, 1,400 boats, and 85 aircraft. The Coast Guard estimated that 1,355 miles of shoreline were affected by the spill, and less than one-third of the beaches has been treated by Exxon. Exxon indicated that 1,077 miles of beach had been oiled to some degree, and oil-damaged shorelines were cleaned to the point of being "environmentally stable." State of Alaska officials disagreed. Of the miles of beach oiled, 347 miles were within the Prince William Sound, with the remainder in the Gulf of Alaska. Exxon estimated that it spent $1.28 billion on the spill. Law suits are expected to bring this total to well over $2 billion. The 1978 oil-spill cleanup from the tanker *Amoco Cadiz* was estimated to cost between $100 and $200 million. That spill was the worst tanker spill, spilling 68 MMgal of oil off the coast of France. The 1969 Santa Barbara Union Oil Company Platform A spill was estimated to cost $11 million for the cleanup and $16.7 million in damages, with between 20,000 and 77,000 bbl (840,000 gal and 3.23 MMgal) spilled. Exxon estimated that the repairs on the *Exxon Valdez* itself would cost approximately $25 million. Exxon estimated in September 1989, that approximately 61,000 bbl or 23 percent of the spilled oil had been recovered, and that 25 percent of the spilled oil may have evaporated early during the spill. The remainder of the oil has either dissolved or dissipated into the water column, dispersed out of the area, or has been deposited onto and into the sediment. The State of Alaska and others dispute the amount of oil recovered, with estimates ranging from 5 percent to 12 percent. The State of Alaska estimated that the total oil spilled was 257,000 bbl, with 30 percent lost to evaporation, and that 66,000 bbl of oil/water were recovered, of which about 50 percent (33,000 bbl) was oil, which was 13 percent of the volume spilled.

October 5, 1989. The Coast Guard and the oil companies announced new rules in an effort to increase tanker safety transiting into Valdez. The rules would not allow tankers to leave the shipping lanes in order to avoid floating ice, as was the case leading to the *Exxon Valdez* spill. Exxon reported that its tankers would not sail at night in the area if ice was reported in the lanes.

October 11, 1989. The trial for Captain Joseph Hazelwood, former Exxon skipper and captain of the *Exxon Valdez* during the spill, is scheduled to begin January 22, 1990. Hazelwood is charged with three felony counts for second-degree criminal mischief and three misdemeanor counts for operating a vessel while intoxicated, for reckless endangerment, and for negligent discharge of pollutants. The trial was supposed to begin October 30, 1989. Both the prosecuting and defense lawyers did not object to the selection of Anchorage Superior Court Judge Karl Johnstone as the presiding judge in the case. The defense attorneys did object to selecting Anchorage as the site of the trial, with concerns of fairness because of the massive media coverage of the oil spill. Hazelwood is also hoping to have the charges against him dismissed because of a 1976 Federal clean-water law that states that if the incident is reported, immunity from criminal prosecution is granted.

October 16, 1989. The State of Alaska announced that all oil tankers would be barred from entering the Port of Valdez unless they had State-approved oil-spill contingency plans. Of the 80 tankers currently involved in Valdez trade, only a handful have State-approved cleanup plans. Approximately 80 MMgal of crude oil is shipped from Valdez every day. The new rule was to become effective in mid-November 1989.

December 4, 1989. The spill cleanup effort by Exxon was estimated to cost $1.9 billion, to date. This estimate was released by Secretary of Transportation Samuel Skinner. Exxon indicated only that over $1 billion had been spent, and $160 million had been paid out to fishermen and others who claimed damages from the spill. Earlier estimates for the cleanup were put at $1.28 billion. Numerous lawsuits are still pending.

Wildlife Rescue Effort and Losses

Exxon assembled a staff of over 220 people for the sea otter rescue efforts. Treatment and rehabilitation centers were set up in Valdez, Seward, and Homer, Alaska. A fleet of over 115 vessels were used for animal rescue efforts. The Fish and Wildlife Service estimated through August 1989, that 984 dead sea otters were recovered, as well as over 34,000 dead birds, including 139 bald eagles. The total number of animals that died may be much higher, since many have not been recovered. Some wildlife expert estimates indicate that as few as 5-10 percent of the actual animals killed are recovered. One human fatality has been attributed to the spill. Exxon estimated that it spent over $30 million on the rescue and treatment of wildlife. By the end of July 1989, an estimated total of 1,446 birds and 359 sea otters were captured alive.

The State of Alaska Department of Fish and Game reported on August 30, 1989, that this year's salmon catch was very close to the record high, despite the massive oil spill in the Prince William Sound. The catch so far this year has reached 138 million salmon, the second highest number ever, with the number expected to break 140 million. The highest recorded year was 1985, with a total salmon catch of 146.7 million. This year, fishermen have already caught 40 percent more fish than last year at the same time. These high yields include the Prince William Sound, the site of the spill. In the Sound itself the catch so far this year has been 23 million salmon, nearly double 1988's total catch. This year was predicted to be a record catch for the Sound, with estimations of 40 million salmon.

Chronology of the Department of the Interior and the Minerals Management Service Response to the Spill

The Department of the Interior's Minerals Management Service (MMS) is the Federal agency given the responsibility of managing the nation's OCS oil and gas leasing program (OCS Lands Act, as amended, 1978). The agency does not regulate tanker or marine vessel traffic. These are regulated by the U.S. Coast Guard while in U.S. waters, and by international convention through the International Maritime Organization (IMO) in international waters. The oil that was spilled by the *Exxon Valdez* was not produced as a result of the Federal OCS leasing program, but rather through the State of Alaska program in the Prudhoe Bay area. The oil was also not spilled as a result of exploration and/or production operations at the site of the oil field, but rather during the transportation phase of getting the oil to the lower 48 States for refining and consumption. The majority of oil produced on the U.S. OCS is transported by offshore and onshore pipeline systems. Historically, far fewer oil spills have occurred and far less oil has been spilled by offshore pipelines than by marine tankers.

April 1989. Secretary of the Interior Manuel Lujan announced the creation of a 3-year $6-million program to (1) improve the oil spill response capability for open-ocean spills and (2) to develop better oil-spill recovery and cleanup equipment and methodology for large spills. The costs of the program are to be shared by the Department of the Interior and the oil industry.

April 18, 1989. The Secretary of the Interior directed the MMS to assess current practices and procedures governing oil-spill management to ensure that response capabilities are prompt and effective. The Secretary also told MMS to (1) examine research and development opportunities to improve oil-spill cleanup technology and (2) study the long-term effects of the spill on the marine biology, fisheries, and wildlife of the area, in conjunction with other Federal agencies. The Secretary also indicated that Exxon agreed to fund resource damage studies, committing $15 million initially.

April 18, 1989. The Director of the MMS indicated that MMS would immediately increase spot inspections of all offshore operations and related facilities. The Director also indicated that oil-spill drills would be increased and that a research and development program aimed at advancing oil-spill cleanup and containment technology would be accelerated. The MMS would also participate in assessing the long-term effects of the *Exxon Valdez* spill.

April 19, 1989. The MMS Associate Director indicated that whenever an oil spill occurs, even if it is not OCS related, such as the Prince William Sound (*Exxon Valdez*) spill, MMS reviews its own operating procedures to learn from the situation. As a result of this review, MMS will be increasing its oil-spill drills in the OCS regions to improve response readiness, communications, and decision-making procedures. The Associate Director also indicated that MMS had the only oil-spill containment and cleanup research program in the Federal Government. As a result of this program, MMS could be developing standards to test cleanup equipment. The Secretary of the Interior announced a joint research program with the American Petroleum Institute (API) to develop improved oil-spill response technology.

November 22, 1989. It was announced that a joint Federal-State office will open in January, 1990, to monitor the trans-Alaska oil pipeline and a proposed natural gas pipeline. The office will combine functions from the Federal Bureau of Land Management of the Department of the Interior with a new office within the State's Department of Natural Resources.

Chronology of the Oil Industry's Response to the Spill

The U.S. oil and gas industry strives to make its operations as safe as possible. Individual oil companies, such as Exxon, as well as national and local industry associations and cleanup cooperatives such as the API, the Alaska Oil and Gas Association, Alyeska, and the Cook Inlet Response Organization spend millions of dollars on research and development of better drilling techniques; oil-spill control and cleanup methodologies including chemical dispersants, safer pipeline and tanker operations; and other aspects related to oil and gas exploration, production, and transportation. All of the major parties operating in the Valdez area have undertaken changes in operations or procedures in order to increase operational safety to reduce the chances of another major spill. The API, however, as a national organization based in Washington, D.C., has taken the lead at reviewing and recommending improvements to the oil and gas industry overall. These efforts are described below.

__April 7, 1989.__ The API announced the formation of a task force to review the oil industry operations regarding oil-spill prevention and response. The 3-month effort examined spill prevention, spill response, and spill research. The task force recommended the industry take action in those areas by developing a program that will cost $250 million over the first 5 years, and will provide improved environmental protection wherever tankers operate in U.S. waters. The program would be funded by a charge on crude and fuel oil carried by sea.

__May 1989.__ At the annual shareholders meeting, Exxon announced the creation of a six-member committee on public issues, including four non-Exxon employees. The purpose of the committee is to review the corporation's "policies, programs, and practices on public issues of significance, including their effects on the environment and worker safety and health."

__June 1989.__ The International Maritime Organization (IMO) was requested by the Paris Economic Summit to develop proposals to further prevent oil pollution of the world's oceans. In response to the request, the Coast Guard has initiated convening an international conference to develop an international convention on emergency preparedness and response to oil spills from ships.

__June 20, 1989.__ Major oil companies, through the API task force, propose creating a Petroleum Industry Response Organization (PIRO), a coast-to-coast network of spill cleanup experts and equipment that can quickly respond to a major oil spill anywhere in the United States. PIRO would maintain an oil-spill data bank, participate in oil-spill-related research, provide training and auditing guidance, and coordinate with the Federal multiregion response centers. The proposal was in response to the *Exxon Valdez* spill. The proposed organization would be headquartered in Washington, D.C., with regional response centers in New York, N.Y.; Norfolk, Va.; New Orleans, La.; Long Beach, Calif.; and Seattle, Wash.. Each center would be staffed 24 hours a day and would be equipped to handle a 30,000-ton oil spill, about the size of the *Exxon Valdez* spill. The project would be funded by the oil industry, and would spend $250 million over the next 5 years, with $70-$100 million as up-front capital costs. For further information on this project, contact the following agency:

American Petroleum Institute
1220 L St. NW.
Washington, D.C. 20005
(202) 682-8128

__August 1, 1989.__ Alyeska, which operates the Trans-Alaska Pipeline, announced its new oil-spill contingency plan for the Prince William Sound. The plan calls for escort vessels equipped with oil-spill cleanup crews and equipment to follow each tanker loaded with oil leaving the Alyeska terminal at Valdez until it is beyond the Sound. In addition to those vessels, Alyeska has improved its oil-skimming devices and booms. The new plan requires that tanker owners file individual oil-spill contingency plans with the State of Alaska and contract with Alyeska for cleanup services. Alyeska is also proposing to stockpile oil-spill equipment in Whittier and Cordova, Alaska, as well as at key fish hatcheries. Local residents will be trained in deploying the equipment. The plan theoretically would handle spills up to 240,000 bbl, about the size of the *Exxon Valdez* spill. Alyeska has formed an around-the-clock oil-spill response team at the Valdez marine terminal. Chemical dispersants and application systems will be maintained on site at Valdez. Three large emergency response vessels have been acquired and will be on site around May 15, 1990, after undergoing modifications. These vessels will complement the vessels already owned by Alyeska. The response system will cost about $45 million per year, excluding the cost of training personnel. Additionally, ship owners that use the Valdez terminal will be required to institute random drug and alcohol tests. The funds for the whole program will likely come from either a user fee for shippers or a pipeline tariff. The contingency plan has not been approved by the Alaska Department of Environmental Conservation, which has given Alyeska a deadline of December 31, 1989, for completion. Alyeska is also making a full assessment of its response to the spill to assure that all opportunities for improved spill response are acknowledged. A task force of Alyeska, a company composed of several other companies, will then make additional recommendations for improved equipment and spill management for the Valdez terminal and Prince William Sound area.

August 30, 1989. Exxon Corporation announced the selection of John H. Steele as a director and member of the board's newly created public issues committee, which will monitor the company's environmental policies. Steele is currently the president and a senior scientist at the Woods Hole Oceanographic Institute in Massachusetts. The appointment was in response to large shareholder demands, following the spill, to place an environmental expert at a high corporate level.

October 11, 1989. Cook Inlet oil shippers announced that they would keep a 190-foot work boat on standby in case a tanker loses power or spills oil. The vessel will be loaded with 5,000 feet of oil-spill boom. The vessel was to be leased by November 1, 1989, with a permanent vessel to replace it by March 1, 1990. In addition to the response vessel, the oil companies proposed to the following:

(1) keep tankers at least 25 miles off the southern Kenai Penninsula;

(2) develop with the Coast Guard safe anchorages in Cook Inlet;

(3) purchase additional booms and other spill cleanup equipment for the Cook Inlet Response Organization;

(4) police compliance of tankers with oil-spill contingency plans; and

(5) set up a users' organization of industry, local government, fishermen, and others.

The response boat will be leased by Alaska's three refineries: Tesoro, Chevron, and Mapco, at a cost of $2 million per year.

October 11, 1989. ARCO Marine Inc., a tanker transport company that carries Alaska North Slope crude oil from Valdez to west coast ports, announced that as a result of the *Exxon Valdez* oil spill, its tankers will modify their routes and be fitted with navigation systems that indicate whether automatic-pilot systems are engaged. The routes will be 100 miles offshore after leaving the Valdez sea lanes. The shift in routing will not only increase vessel safety but also increase operating costs by about $1 million per year as a result of additional fuel and time. In addition, captains have been instructed to remain in their assigned sea lanes after leaving Valdez, regardless of the ice conditions. If ice is present, the tankers are to be operated at slower speeds. ARCO is also reviewing whether the traditional shipboard practice of the captain's word not being questioned is better than a team approach to shipboard decisions.

October 13, 1989. Exxon Corporation, both directly and through contractors and subcontractors, used the following amounts of equipment, personnel, funds, facilities, etc., from 36 States and 6 foreign nations during the course of the 6-month cleanup effort: over 15,000 people; $267 million in wages (93 percent of which went to Alaskan residents originating in over 125 Alaskan towns and villages); $443 million in supplies, subcontractors, and boat leases; 225 zodiaks (small inflatable boats), 275 skiffs, 700 outboard motors, 350 generators, 490 steam cleaners, 875 pumps, and 173 cars and pick-up trucks; and over 17 million hours of human effort.

October 14, 1989. The oil industry spill-cleanup cooperative, Clean Sound, Inc., announced the purchase of $13 million worth of additional oil-spill cleanup equipment. Clean Sound is responsible for the Puget Sound area of Washington, and receives daily tanker shipments of Alaskan North Slope crude oil, such as was carried by the *Exxon Valdez*. The new equipment will include a 123-foot ocean oil skimmer, one of the largest in the world. A similar skimmer will also be going to Alaska. The new equipment is to be delivered and deployed within a year.

October 15, 1989. Exxon Corporation doubled the amount of the settlement being issued to the 600 drift-net fishermen in the Cook Inlet. The total is now $45 million, with an average of $75,000 going to each permit holder, rather than the $31,000 agreed to earlier. The difference stems from the lower forecast of 2.5-million fish harvest, estimated by the Alaska Department of Fish and Game, versus the actual 4.9 million salmon caught by setnetters, plus 1 million fish that exceeded escapement goals on the Kenai River.

October 23, 1989. Exxon Corporation filed a lawsuit against the State of Alaska, charging that the oil-spill cleanup was hindered because the State opposed the use of oil-spill chemical dispersants. A State official said that the State had approved the use of chemical dispersants for cleanups before the spill. The Exxon suit was a counterclaim to a suit filed by the State of Alaska in August, against Exxon and Alyeska. The suit claims that the State interference resulted in much of the spill damage and the State should therefore reimburse Exxon for the money the company expended on the spill. Exxon states that immediate use of dispersing chemicals to break up the oil into droplets was a critical first step in the State-approved oil-spill contingency plan. The Alaska Department of Environmental Conservation commissioner stated that the State wasn't opposed to dispersant-use and Exxon wasn't prepared with adequate supplies of dispersant in the area anyway. Alyeska filed a counterclaim lawsuit in Anchorage Superior Court against the State of Alaska. The suit claims that because the State approved an oil-spill contingency plan in effect at the time of the spill and participated in the cleanup efforts, the State contributed to the spill damage.

November 5, 1989. It was reported that a huge vessel, dubbed an "environmental battleship" is on the drawing boards. The vessel would be used to clean up very large oil spills, such as the *Exxon Valdez* spill. It would include spill boom, skimmers, dispersants and applicators, waste processing and storage, helicopter landing facilities, satellite communications, laboratories, and a command post. The designers were to present their plan to Congress and the oil industry.

November 17, 1989. Alyeska announced that new rules for tankers traveling through the Prince William Sound were going into effect. Tankers will be required to stay within the shipping lanes, slowing down and/or manuevering through any iceflows, rather than swinging wide around the ice. The maximum speed for tankers in the Sound is now set at 10 knots, and an Alyeska escort vessel must be within a half-mile of the tanker the entire time the tanker is in the Sound. If the rules are not obeyed, Alyeska will deny terminal docking after the second infraction.

Chronology of Congressional Response to the Spill

Oil-spill legislation has been a frequent topic of discussion and has led to the introduction of over 25 different bills relating to oil-spill prevention, response, liability, and cleanup.

April 4, 1989. Senator Mitchell, a Democrat from Maine, introduced Senate bill S.686, the Oil Pollution and Compensation Act of 1989. It was passed on August 4, 1989, after being amended to include provisions introduced in separate bills by Senators Adams, Stevens, Kerry, and Lautenberg.

May 8, 1989. Senator Frank Lautenberg, a Democrat from New Jersey, detailed legislation to be introduced that would give the Coast Guard responsibility for (1) ensuring the adequacy of oil-spill contingency plans and (2) enforcing changes to bring them up to standards. It would also require the Federal Government to review oil-spill cleanup technologies and make recommendations on how to improve them.

August 4, 1989. The U.S. Senate unanimously approved comprehensive oil-spill liability and compensation legislation. The bill would increase by six-fold the financial liability of oil companies and create a $1 billion trust fund to be used by the Federal Government to respond to oil spills and compensate economic victims of oil spills. It would be financed by a 3-cents-per-barrel fee on all domestic and imported oil. Eight regional response teams would also be created off all coastal areas to respond to any oil spills. The bill would allow the States to retain or enact unlimited liability legislation and compensation laws. The equivalent measure introduced in the House originally preempted State laws. The bill raises the penalty for spilling oil from $5,000 per day to $25,000 per day or $1,000 per barrel. In addition, the bill imposes minimum personnel standards on tankers, and the Government could require double hulls for tankers. Natural resource damage and damage assessment are also addressed by the bill, as well as a spill research and development program.

September 15, 1989. Legislation was introduced in Congress that would create a nine-member Presidential task force to audit the Trans-Alaska Pipeline System and its operations. The measure would also redirect a 5-cents-per-barrel tax on North Slope crude oil from the Trans-Alaska Pipeline Liability Fund into a new national account (discussed above) that would be used for oil pollution prevention and environmental protection along the pipeline. It is expected that the measure will be added to the comprehensive oil-spill liability and prevention package already introduced into both houses of Congress. The bill would also create an Alaska oil-spill research center in Cordova.

November 8-9, 1989. Three months after the Senate voted 99-0 for a comprehensive oil-spill liability bill and after much debate, the House of Representatives finally voted (279-143) passage of such a bill, H.R. 3027. The debate had been going on for over 14 years, but was especially controversial this year after the *Exxon Valdez* spill. A critical issue included whether or not to establish a Federal standard preempting State laws on liability for cleanup costs. Both the Senate and House versions did not preempt the State's authority to determine how much a polluter should be required to spend for cleanups. Nineteen States already had laws with no liability limits. The bill also calls for establishment of a $1-billion oil-spill cleanup fund (to be generated by an additional tax on oil) and more stringent requirements for responding to and preventing oil spills. One day after the House vote, the bill was amended to not include unlimited liability for oil companies or oil carriers for "simple negligence." The original language of "gross negligence" was reinstated. The House and Senate versions are still to be reconciled. The House bill also includes (1) requiring double hulls on all new tankers and existing tankers within 15 years, (2) setting up a national contingency program, and (3) creating a national fund for damages not covered by the spiller.

Chronology of Other Federal Agency Responses to the Spill

The Federal Government has a National Response System, for dealing with oil and hazardous substance spills. The legal authority for this system comes from the Clean Water Act, which establishes a fund for Federal responses to oil spills, and the Comprehensive Environmental Response, Compensation, and Liability Act, which establishes the Superfund for Federal responses to hazardous material releases. The primary component of this Federal response system is the National Oil and Hazardous Substances Pollution Contingency Plan, or simply the National Contingency Plan (NCP). The first NCP was adopted in 1968, prior to Federal regulation. The NCP establishes a National Response Team (NRT), Regional Response Teams (RRT's), On-Scene Coordinators (OSC's), and a National Response Center (NRC).

Numerous Federal agencies have either direct or indirect responsibility for the cleanup effort following an oil spill, such as from the *Exxon Valdez*. The NRT and the RRT are co-chaired by the EPA and the Coast Guard. The EPA is the lead on inland spills or hazardous leaks, the Coast Guard is the lead on coastal and oceanic spills. A representative from either the EPA or the Coast Guard will serve as the OSC, ensuring that the appropriate cleanup measures are being undertaken, if the spiller is either unidentified or has not demonstrated the ability or the willingness to properly manage the spill cleanup. The NRT and RRT's are composed of numerous other Federal representatives and State representatives, all of whom are available to support the cleanup effort by providing technical advice and/or logistical support and equipment, as needed. The National Oceanic & Atmospheric Administration (NOAA) provides a Scientific Support Coordinator (SSC), to assist the OSC in making immediate decisions regarding the spill cleanup strategy. Other members of the NRT and the RRT's include the Departments of Interior, Commerce, Transportation, Energy, Labor, State, Justice, Health and Human Services, Agriculture, Defense; the Nuclear Regulatory Commission; and the Federal Emergency Management Agency.

April 19, 1989. U.S. Coast Guard Commander Yentsch indicated that an investigation would be conducted to determine if the established vessel traffic system in Valdez was adequate. The grounding had occurred south of the Narrows area, which is monitored.

May 1989. The EPA is providing resources for the cleanup and restoration of the Prince William Sound. During the first 30 days of the spill, the EPA spent $100,000 on cleanup efforts. The EPA will continue its cleanup efforts if funding can be obtained. The Secretary of Transportation and the Administrator of the EPA released a NRT report to the President, indicating that Government and industry oil-spill contingency plans are wholly insufficient to control an oil spill of the magnitude of the *Exxon Valdez*. The report also discussed preliminary lessons learned from the spill and effects of the spill. The NRT was also requested by the President to conduct a nationwide review of port and harbor contingency plans. The Marine Board of Investigation (DOT/Coast Guard) is conducting an investigation to determine if any wrongdoing on the part of the captain or crew occurred. The Coast Guard could suspend or revoke licenses or personnel documents. The National Transportation Safety Board is investigating responsibility for the spill and will make recommendations to avoid such accidents in the future.

Chronology of State Agency Responses to the Spill

The two Alaska State agencies involved with the *Exxon Valdez* spill are the Departments of Environmental Conservation (DEC), and Fish and Game. These agencies as well as the Governor's Office were involved in the monitoring and cleanup efforts of the spill immediately upon the spill's being reported. The DEC is the State agency responsible for reviewing and approving local oil-spill contingency plans such as the one that had been prepared by the Alyeska Pipeline Service Company, for the Prince William Sound and Valdez area. Fish and Game biologists were immediately out in the field collecting and recording bird and marine mammal fatalities, as well as rescuing for cleanup any oiled animals found alive.

June 1, 1989. Alaska Governor Steve Cowper threatened to shut down the Alyeska terminal unless the oil-spill response capabilities are greatly improved.

September 15, 1989. Alaska Governor Steve Cowper announced plans for continuing the mop-up effort through winter, preparing for next spring's cleanup efforts. The winter plan calls for cleaning beaches, tracking oil, protecting fish, and developing new cleanup techniques. The State indicated that $21 million would be available for the winter cleanup, and it will seek reimbursement from Exxon.

October 16, 1989. Dennis Kelso, Chief of the Alaska DEC, said that operators of oil tankers headed for Valdez had 1 month to file detailed oil-spill contingency plans for the individual tankers and contract with the Alyeska Pipeline Company for oil-spill cleanup services, or they would be barred from loading oil at the Alyeska terminal in Valdez. Such a law has existed for many years, but was not enforced because the Alyeska Pipeline Company agreed to respond to any spills without prior receipt of plans and a contract. Alyeska had recently stated that it would handle the initial response to any spills but not the long-term cleanup effort. November 13, 1989, was given as the deadline for filing individual contingency plans with Alyeska, but the State indicated that it would work with individual shippers that submit their own plans.

October 24, 1989. The Alaska DEC denied permission to dock to the Unocal tanker *SanSinena II* because it had no State-approved oil-spill contingency plan. The tanker was allowed to unload its 14.7 MMgal of crude oil on October 27, 1989, after another company, ARCO Marine, with a State-approved contingency plan, agreed to cover the tanker with its plan. The ship was carrying North Slope crude oil from Valdez to a refinery at Nikiski, Alaska.

November 1, 1989. Governor Cowper approved over $6 million for winter oil-spill cleanup activities for communities affected by the spill. The funds are part of the $21 million program announced previously. About $3 million has already been allocated to local communities. The funds will be used primarily for the winter cleanup effort, as well as preparation for the spring cleanup work.

The Alaska State Legislature has passed bills that would accomplish the following:

(1) increase civil fines for oil spills from $10 per gallon to as much as $50 per gallon,

(2) increase the cap on fines from $100 million to $500 million,

(3) prohibit oil companies from writing off spill cleanup costs from their oil severence tax payments,

(4) require DEC to prepare a statewide master plan for oil-spill cleanups and hazardous waste accidents, including contingency plans for all coastal areas where dangerous cargoes are moved by water,

(5) create an oil and hazardous substance response office that would use local volunteers for the initial response,

(6) raise oil production taxes by 5 cents per barrel, and

(7) create an independent commission to investigate the spill.

November 30, 1989. The State of Alaska District Attorney's Office announced that it would not prosecute Gregory T. Cousins, the third mate of the *Exxon Valdez*, who was piloting the ship at the time it hit the reef. The third mate was not qualified to pilot the ship. The District Attorney's Office is hoping Cousins will cooperate with the prosecution of Captain Joseph Hazelwood. Hazelwood is charged with three felony and three misdemeanor charges. The trial is expected to begin in January 1990 in Anchorage.

Chronology of Studies Proposed or Initiated in Response to the Spill

Numerous Federal, State, and local governments, as well as industry and environmental groups have been involved in the cleanup efforts directly and/or are seriously concerned with the short- and long-term effects of the spill on the wildlife, fisheries, recreational, economic, and other resources of the area. Primary concerns include the actual effects of the spill on wildlife populations including endangered species and commercial fisheries, assessment of the environmental damage, as well as recovery of the environment to prespill conditions. To determine these factors numerous environmental studies have been proposed and begun. These are descibed below.

April 19, 1989. The National Marine Pollution Board, which includes all major Federal agencies, including MMS, established a task force to develop a long-range research program to study the ecological impacts of the spill. The State of Alaska was contacted to participate as well.

August 21, 1989. Exxon, in announcing that a task force will be kept in the Prince William Sound to monitor the oiled areas, also indicated that a staff of 280 will be maintained mostly in Anchorage, Alaska, to process claims and analyze spill data. The spill data are being collected in connection with the 26 separate scientific studies being conducted on the spill.

August 22, 1989. An interagency oil-spill trustee council composed of representatives from the State of Alaska Department of Fish and Game, the U.S. Departments of Agriculture, Commerce, and Interior, with the Environmental Protection Agency assisting, released a draft comprehensive plan outlining more than 60 studies to assess the damage and restoration costs from the Prince William Sound oil spill. The environmental studies will be completed by the end of February 1990, about 1 year after the spill occurred. The assessments have three major components:

(1) determination and quantification of injury,

(2) determination of natural resource damages, and

(3) development of a restoration and recovery strategy. The cost of the studies is $35 million, of which Exxon has already paid $15 million.

The State and Federal governments will pay the balance and then bill Exxon for this remainder as well as the restoration costs.

Virtually all of the studies were begun immediately, because time is critical in such an incident. No studies will continue beyond February 28, 1990, unless approved by the Trustrees as necessary for restoration and natural resource damage assessment. The studies are to focus on the effects of the spill on most types of wildlife, as well as air and water pollution found in the Prince William Sound, and the economic impact of the spill on commercial fisheries, recreation, public lands, and archaeological resources. The public comment period on the plan was extended from September 30 to October 30, 1989.

The National Ocean Pollution Policy Board (NOPPB) commissioned an "Extended Studies Program Plan." The studies are to focus on the environmental and social science issues related to the Prince William Sound spill not covered under the damage assessment plans.

The DOI and the API are to jointly fund a $6-million 3-year research and development program to improve the technology and procedures for oil-spill containment and cleanup. The new Petroleum Industry Response Organization (PIRO) (also discussed under the Industry response, p. 66) is to provide $35 million over the next 5 years to fund studies for (1) improving knowledge of chemical and biological effects of spilled oil, (2) preventing losses from ships, (3) preventing and mitigating shoreline impacts, and (4) using containment booms in the open ocean.

The MMS plans to increase its annual budget by $1 million for oil-spill technology research and development for fiscal years 1989-91. In addition, the MMS studies program will develop a protocol describing how the program might participate in postspill studies. The Fish & Wildlife Service (FWS) has been provided with $56,000 and staff support for aerial surveys of marine mammals (especially sea otters) and seabirds beginning immediately after the spill occurred. Radio tags have been purchased for cleaned and released otters. The National Marine Fisheries Service (NMFS) has been provided with $10,000 to support the NMFS Auke Bay lab sampling program in intertidal and subtidal areas of Prince William Sound. Various contractors will receive $65,000 to continue studies of the effects of the oil spill on the early life stages of herring in the Prince William Sound. The National Oceanic & Atmospheric Administration (NOAA) has received $50,000 to mobilize and transport a NOAA vessel from Prudhoe Bay to Prince William Sound for use in field sampling. The U.S. Geological Survey has received $50,000 to redeploy their ship for sediment sampling in the Prince William Sound. Various contractors have received $25,000, collectively, to deploy surface drifters along the path of the *Exxon Valdez* spill, in order to verify drifter performance against a real spill. The MMS also modified the Alaska Social Indicators study to include a sample of communities that have been affected by the spill.

The House-Senate conference report for the DOI's fiscal year 1990 budget requires that the DOI conduct the following three studies, which are to be submitted by March 1, 1991:

(1) investigate the spill damage to the fisheries of the Prince William Sound, to be conducted by the Fish & Wildlife Service;

(2) determine if contingency plans for oil spills are adequate; and

(3) examine alternative options for buying back leases in the Bristol Bay.

Exxon has funded an eagle capture program along with the FWS to locate and retrieve bald eagles and other raptors impacted by the spill. The EPA and Exxon have a cooperative agreement in which

Exxon will pay $3 million to test an EPA process using phosphate and nitrogen to cultivate microorganisms (bacteria) to degrade oil in aquatic environments.

The Coast Guard has various ongoing studies. These include the following:

(1) a long-term study of port needs into the 21st century,

(2) an operational and technical review of existing vessel traffic systems,

(3) an in-depth technical and operational review of equipment, and

(4) a pilotage study to consider the need for changes in the statutes and other requirements such as pilot training and certification.

The Coast Guard sponsored a conference in September 1989 to examine research and development initiatives and methods for coordinating the management of oil and hazardous materials throughout the Federal Government.

The Department of Energy (DOE) and the State of Alaska are involved in a joint study on the Alaska North Slope Oil Delivery System. Included in the study will be an analysis of new technologies for oil-spill prevention, containment, mitigation, and cleanup. The DOE's Office of International Affairs and Energy Emergencies is working with the International Energy Agency to identify all current and proposed international oil-spill research and development efforts. International cooperation on research and development and oil-spill response capabilities and resource pooling are being explored.

The DOC/NOAA mussel watch program has revisited various intertidal sites in the Prince William Sound. Mussel and sediment samples are being collected for chemical analysis. NOAA's National Benthic Surveillance Project has been expanded to include the Prince William Sound. Fish and crustacea are being collected for analysis of hydrocarbon concentrations.

The Office of Technology Assessment was requested by Congress to evaluate the capabilities of the Federal Government and the private sector to respond to a major oil spill, the usefulness of existing technology, the adequacy of planning efforts, and the organizational approaches to maintaining a spill response capability. The National Academy of Sciences (NAS)/National Research Council was requested by the Coast Guard to assess alternative tank vessel design such as double hulls and double bottoms, for improved vessel safety and marine environment protection. The NAS will also be producing an annotated bibliography on oil-spill related research and development.

Fall 1989 and Winter 1990 Cleanup Program

Exxon Corporation. Exxon will decide in the last half of March 1990 what work will be needed through the summer. For winter 1989-90, Exxon will employ 380 people in Alaska, mostly in Anchorage, and another 320 people outside Alaska, in laboratories. The names of another 250 people will be kept on-call in case of emergencies. Exxon will maintain five large vessels and eight aircraft to monitor the spill and cleanup any slicks detected. Exxon will also keep packages of oil-spill cleanup equipment on site in the area of the spill at towns, villages, and hatcheries. Local people will be employed to pick up any oil blobs found. Exxon will study what the oil does over winter and how it affects fish and wildlife, develop technologies to clean it up, and document any archaeological finds in the area. Exxon will study the long-term effects on natural resources, including water, sediment, coastal biology, crab, shrimp, salmon, kelp, eelgrass, birds, and mammals. Exxon will maintain community liaison workers in the areas affected by the spill.

Exxon will maintain the cleanup equipment used this past summer for future use, if necessary.

State of Alaska. Governor Cowper indicated that the State would commit $21 million to the winter cleanup effort. The State will (1) contract for cleanup work in some areas; (2) accept proposals from local communities to do the cleanup work; (3) provide additional social services in areas affected by the spill; (4) keep track of wildlife fatalities, archaeological sites, and oil movement; (5) maintain an oil-spill staff in Valdez, Homer, Seward, and Kodiak, Alaska; and (6) study the effects of the oil over winter and what new technologies could be used next spring.

Federal Agencies. The Coast Guard will keep 39 people on staff in Anchorage, Valdez, Kodiak, Homer, and Seward to (1) monitor cleanup activities, (2) fly over the spill, and (3) conduct administrative activities. NOAA will study the biology, geology, and chemistry of oil on various beaches affected by the spill.

BLANK PAGE

Appendix B: Bibliography of OCS Information Reports

The following is a regional listing of documents published by the OCS Information Program. Entries are arranged by title in reverse chronological order, listing the most recent publication first. Requests for copies of these publications should be directed to the following office:

Document Distribution Center
Offshore Information & Publications
Minerals Management Service, MS 4610
381 Elden St.
Herndon, VA 22070-4817
(703) 787-1080 or (FTS) 393-1080

Alaska Region

Arctic Subregion Summary Reports and Updates

- Arctic Summary Report, January 1985, Outer Continental Shelf Oil and Gas Activities in the Arctic and their Onshore Impacts. Christopher W. Lynch, Douglas L. Slitor, and Robert W. Rudolph. 1985. OCS Information Report, MMS 85-0022, U.S. DOI, 84 p.

- Arctic Summary Report Update, September 1983, Outer Continental Shelf Oil and Gas Activities in the Arctic and their Onshore Impacts. Jeffrey L. Deis and Robert Pierson. 1983. U.S. DOI, 58 p.

- Arctic Summary Report, January 1983, Outer Continental Shelf Oil and Gas Activities in the Arctic and their Onshore Impacts. Joanne Barnes Jackson and Frederick N. Kurz. 1983. U.S. DOI, 81 p.

- Update 1, May 1982, Outer Continental Shelf and Onshore Oil and Gas Activities and Impacts in the Arctic: A Summary Report, October 1981. Joanne Barnes Jackson and Barbara Cushmore Pretz. 1982. USGS Open-File Report 82-19, U.S. DOI, 76 p.

- Outer Continental Shelf and Onshore Oil and Gas Activities and Impacts in the Arctic: A Summary Report, October 1981. Joanne Barnes Jackson, B. Fritts Golden, Anne Stadnychenko, and Sharon Kolasinski. 1981. USGS Open-File Report 81-621, U.S. DOI, 137 p.

Bering Sea Subregion Summary Reports and Updates

- Bering Sea Summary Report, September 1984, Outer Continental Shelf Oil and Gas Activities in the Bering Sea and their Onshore Impacts. Jeffrey Deis. 1984. OCS Information Report, MMS 84-0076, U.S. DOI, 84 p.

- Bering Sea Summary Report, September 1983, Outer Continental Shelf Oil and Gas Activities in the Bering Sea and their Onshore Impacts. Jeffrey Deis, Robert Pierson, and Frederick N. Kurz. 1983. U.S. DOI, 81 p.

Gulf of Alaska Subregion Summary Reports and Updates

- Gulf of Alaska Summary Report Update, May 1984, Outer Continental Shelf Oil and Gas Activities in the Gulf of Alaska and their Onshore Impacts. Jeffrey D. Wiese. 1984. OCS Information Report, MMS 84-0030, U.S. DOI, 27 p.

- Gulf of Alaska Summary Report Update, April 1983, Outer Continental Shelf Oil and Gas Activities in the Gulf of Alaska and their Onshore Impacts. Joanne Barnes Jackson. 1983. U.S. DOI, 29 p.

- Gulf of Alaska and Lower Cook Inlet Summary Report 3, June 1982, Second Revision of Outer Continental Shelf Oil and Gas Activities in the Gulf of Alaska (including Lower Cook Inlet) and their Onshore Impacts: A Summary Report, September 1980. Joanne Barnes Jackson and Frederick N. Kurz. 1982. USGS Open-File Report 82-20, U.S. DOI, 79 p.

- Gulf of Alaska and Lower Cook Inlet Summary Report 2, June 1981, A Revision of Outer Continental Shelf Oil and Gas Activities in the Gulf of Alaska (including Lower Cook Inlet) and their Onshore Impacts: A Summary Report, September 1980. Karen M. Collins and Anne Stadnychenko. 1981. USGS File Report 81-607, U.S. DOI, 49 p.

- Outer Continental Shelf Oil and Gas Activities in the Gulf of Alaska (including Lower Cook Inlet) and their Onshore Impacts: A Summary Report, September 1980. Joanne Barnes Jackson and Richard T. Dorrier. 1980. USGS Open-File Report 80-1028, U.S. DOI, 78 p.

Regionwide Alaska Summary Reports and Updates

- Alaska Update: September 1988-January 1990 Outer Continental Shelf Oil & Gas Activities. Gregory J. Gould, Robert M. Karpas, and Douglas L. Slitor. 1990. OCS Information Report MMS 90-0012, 81 p.
- Alaska Update: January 1987-August 1988, Outer Continental Shelf Oil and Gas Activities. 1988. OCS Information Report MMS 88-0073, 44 p.
- Alaska Summary Report (June 1984-December 1985) Outer Continental Shelf Oil and Gas Activities in Alaska and their Onshore Impacts. James H. Collins and Christopher W. Lynch. 1986. OCS Information Report, MMS 86-0023, U.S. DOI, 114 p.

Alaska Indexes

- Alaska Index (May 1983-January 1985). Denise D. Molajo. 1985. OCS Information Report, MMS 84-0037, U.S. DOI, 84 p.
- Alaska Index (December 1981-April 1983). Mary Ann Collignon. 1983. U.S. DOI, 74 p.
- Alaska Index (December 1980-November 1981). Mary Ann Collignon. 1982. USGS Open-File Report 82-18, U.S. DOI, 81 p.
- Alaska Index (December 1974-November 1980). Richard T. Dorrier. 1981. USGS Open-File Report 81-20, U.S. DOI, 85 p.

Alaska Summary/Index

- Alaska Summary/Index: January 1986-December 1986. D. L. Slitor and J. D. Wiese. 1987. OCS Information Report, MMS 87-0016, 102 p.

Atlantic Region

North Atlantic Summary Reports and Updates

- North Atlantic Summary Report Update, June 1983, Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts. Alan S. Kurtz and Jeffrey L. Deis. 1983. U.S. DOI, 23 p.
- North Atlantic Summary Report Update, February 1983, Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts. Jeffrey L. Deis. 1983. U.S. DOI, 33 p.
- Update 1, April 1982, Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts: A Summary Report. Jeffrey L. Deis and Elizabeth O. Porter. USGS Open-File Report 82-16, U.S. DOI, 42 p.
- Outer Continental Shelf Oil and Gas Activities in the North Atlantic and their Onshore Impacts: A Summary Report, July 1981. Richard T. Dorrier. 1981. USGS Open-File Report 81-601, U.S. DOI, 65 p.

Mid-Atlantic Summary Reports and Updates

- Mid-Atlantic Summary Report, October 1983, Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts. Alan S. Kurtz and Jeffrey L. Deis. 1983. U.S. DOI, 44 p.
- Mid-Atlantic Summary Report 2, October 1982, Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts. Jeffrey L. Deis and Frederick N. Kurz. 1982. U.S. DOI, 63 p.
- Update 3, August 1981, Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts. Catherine A. McCord. 1981. USGS Open-File Report 81-619, U.S. DOI, 12 p.
- Update 2, February 1981, Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts. Richard T. Dorrier. 1981. USGS Open-File Report 81-603, U.S. DOI, 18 p.
- Update 1, June 1980, Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts. Jeffrey L. Deis. 1980. Update to USGS Open-File Report 80-17, U.S. DOI, 18 p.
- Outer Continental Shelf Oil and Gas Activities in the Mid-Atlantic and their Onshore Impacts: A Summary Report, November 1979. George S. Macpherson and Charles A. Bookman. 1980. USGS Open-File Report 80-17, U.S. DOI, 63 p.

South Atlantic Summary Reports and Updates

- South Atlantic Summary Report, December 1983, Outer Continental Shelf Oil and Gas Activities in the South Atlantic and their Onshore Impacts. Kenneth J. Havran and Jeffrey D. Wiese. 1984. U.S. DOI, 34 p.

- South Atlantic Summary Report Update, February 1983, Outer Continental Shelf Oil and Gas Activities in the South Atlantic and their Onshore Impacts. Kenneth J. Havran. 1983. U.S. DOI, 20 p.

- South Atlantic Summary Report 2, May 1982, Outer Continental Shelf Oil and Gas Activities in the South Atlantic and their Onshore Impacts. Jeffrey L. Deis, Frederick N. Kurz, and Elizabeth O. Porter. 1982. USGS Open-File Report 82-15, U.S. DOI, 50 p.

- Update 2, August 1981, Outer Continental Shelf Oil and Gas Activities in the South Atlantic (U.S.) and their Onshore Impacts: A Summary Report, July 1980. Catherine A. McCord. 1981. USGS Open-File Report 81-616, U.S. DOI, 13 p.

- Update 1, February 1981, Outer Continental Shelf Oil and Gas Activities in the South Atlantic (U.S.) and their Onshore Impacts: A Summary Report, July 1980. Kenneth J. Havran. 1981. USGS Open-File Report 81-25, U.S. DOI, 14 p.

- Outer Continental Shelf Oil and Gas Activities in the South Atlantic (U.S.) and their Onshore Impacts: A Summary Report, July 1980. Joanne Barnes Jackson. 1980. USGS Open-File Report 80-626, U.S. DOI, 62 p.

Regionwide Atlantic Summary Report

- Atlantic Summary Report, December 1984, Outer Continental Shelf Oil and Gas Activities in the Atlantic Region and their Onshore Impacts. Robert W. Rudolph and Kenneth J. Havran. 1985. OCS Information Report, MMS 85-0021, U.S. DOI, 74 p.

Atlantic Indexes

- Atlantic Index (June 1984-January 1985). Christopher W. Lynch and Denise D. Molajo. 1985. OCS Information Report, MMS 85-0036, U.S. DOI, 114 p.

- Atlantic Index (June 1983-May 1984). Mary Ann Collignon. 1984. MMS 84-0050, U.S. DOI, 113 p.

- Atlantic Index (June 1981-May 1983). Catherine A. McCord. 1983. U.S. DOI, 120 p.

- Atlantic Index (December 1980-June 1981). Mary Ann Collignon. 1981. USGS Open-File Report 81-705, U.S. DOI, 173 p.

- Atlantic Index (January 1975-November 1980). Martha Alison Salzmann. 1981. USGS Open-File Report 80-1202, U.S. DOI, 193 p.

Atlantic Summary/Index

- Atlantic Summary/Index: January 1985-June 1986, Outer Continental Shelf Oil and Gas Activities. Jeffrey D. Wiese. 1986. OCS Information Report, MMS 86-0071, 38 p.

Gulf of Mexico Region

Gulf of Mexico Summary Reports and Updates

- Gulf of Mexico Update: May 1988-July 1989, Outer Continental Shelf Oil and Gas Activities. Gregory J. Gould. 1989. OCS Information Report MMS 89-0079, 51p.

- Gulf of Mexico Update: July 1986-April 1988, Outer Continental Shelf Oil and Gas Activities. 1988. OCS Information Report MMS 88-0038, 39 p.

- Gulf of Mexico Summary Report/Index, November 1984-June 1986, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico and their Onshore Impacts. Stephen P. Risotto and James H. Collins. 1986. OCS Information Report, MMS 86-0084, 102 p.

- Gulf of Mexico Summary Report, October 1984-June 1985, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico Region and their Onshore Impacts. Christopher W. Lynch and Stephen P. Risotto. 1985. OCS Information Report, MMS 85-0083, U.S. DOI, 108 p.

- Gulf of Mexico Summary Report, September 1984, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico Region and their Onshore Impacts. Christopher W. Lynch and Robert W. Rudolph. 1984. OCS Information Report, MMS 84-0073, U.S. DOI, 108 p.

- Gulf of Mexico Summary Report, September 1983, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico Region and their Onshore Impacts. Jeffrey D. Wiese, Douglas L. Slitor, and Catherine A. McCord. 1983. U.S. DOI, 106 p.

- Gulf of Mexico Summary Report 3, August 1982, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico Region and their Onshore Impacts. Kenneth J. Havran, Jeffrey D. Wiese, Karen M. Collins, and Frederick N. Kurz. 1982. USGS Open-File Report 82-242, U.S. DOI, 99 p.

- Gulf of Mexico Summary Report 2, August 1981, Outer Continental Shelf Oil and Gas Activities in the Gulf of Mexico Region and their Onshore Impacts.

Havran and Karen M. Collins. 1980. USGS Open-File Report 80-864, U.S. DOI, 102 p.

Gulf of Mexico Indexes

- Gulf of Mexico Index (August 1983-October 1984). Denise D. Molajo, Stephen P. Risotto, and Virginia A. Farris. 1984. OCS Information Report, MMS 85-0043, U.S. DOI, 86 p.
- Gulf of Mexico Index (September 1982-July 1983). Mary Ann Collignon. 1983. U.S. DOI, 125 p.
- Gulf of Mexico Index (December 1980-August 1982). Mary Ann Collignon. 1982. U.S. DOI, 157 p.
- Gulf of Mexico Index (January 1978-November 1980). Kenneth J. Havran, Karen M. Collins, Richard T. Dorrier, and Mary Ann Collignon. 1981. USGS Open-File Report 81-313, U.S. DOI, 181 p.

Pacific Region

Pacific Summary Reports and Updates

- Pacific Update: August 1987-November 1989 Outer Continental Shelf Oil & Gas Activities. Douglas L. Slitor and Jeffrey D. Wiese. 1990. OCS Information Report, MMS 90-0013, 100 p.
- Pacific Summary Report, April 1985, Outer Continental Shelf Oil and Gas Activities in the Pacific and their Onshore Impacts. Robert W. Rudolph and Paul M. Nikituk. 1985. OCS Information Report, MMS 85-0040, U.S. DOI, 90 p.
- Pacific Summary Report, July 1984, Outer Continental Shelf Oil and Gas Activities in the Pacific and their Onshore Impacts. Kenneth J. Havran and Christopher W. Lynch. 1984. OCS Information Report, MMS 84-0075, U.S. DOI, 80 p.
- Pacific Summary Report, September 1983, Outer Continental Shelf Oil and Gas Activities in the Pacific and their Onshore Impacts. Kenneth J. Havran. 1983. U.S. DOI, 103 p.
- Pacific Summary Report, December 1982, Outer Continental Shelf Oil and Gas Activities in the Pacific and their Onshore Impacts. 1983. Anne Stadnychenko and Catherine McCord. U.S. DOI, 109 p.
- Pacific Summary Report 2, May 1982, A Revision of Outer Continental Shelf Oil and Gas Activities in the Pacific (Southern California) and their Onshore Impacts: A Summary Report, May 1980. Karen M. Collins, Catherine A. McCord, Anne Stadnychenko, and Peter Yoskin. 1982. USGS Open-File Report 82-21, U.S. DOI, 121 p.
- Outer Continental Shelf Oil and Gas Activities in the Pacific (Southern California) and their Onshore Impacts: A Summary Report, May 1980. George S. Macpherson and Janis Bernstein. 1980. USGS Open-File Report 80-645, U.S. DOI, 134 p.

Pacific Indexes

- Pacific Index (April 1983-October 1984). Denise D. Molajo. 1985. OCS Information Report, MMS 85-0004, U.S. DOI, 84 p.
- Pacific Index (July 1981-March 1983). Jeffrey D. Wiese and Mary Ann Collignon. 1983. U.S. DOI, 86 p.
- Pacific Index (November 1980-June 1981). Mary Ann Collignon. 1981. USGS Open-File Report 81-708, U.S. DOI, 89 p.
- Pacific Index (January 1962-October 1980). Sharon L. Kolasinski. 1980. USGS Open-File Report 80-1201, U.S. DOI, 111 p.

Pacific Summary/Index

- Pacific Summary Report/Index: June 1, 1986-July 31, 1987. Jeffrey D. Wiese and Douglas L. Slitor. 1987. OCS Information Report, MMS 87-0078, 143 p.
- Pacific Summary Report/Index: November 1984-May 1986. Stephen Risotto and Robert Rudolph. 1986. OCS Information Report, MMS 86-0060, 117 p.

National

- OCS National Compendium, Outer Continental Shelf Oil and Gas Information Through September 1988. Gregory J. Gould. 1989. OCS Information Report, MMS 89-0043, 131 p.
- OCS National Compendium, Outer Continental Shelf Oil and Gas Information Through 1984. Paul M. Nikituk and Virginia A. Farris. 1986. OCS Information Report, MMS 86-0017, 172 p.
- OCS Directory, Federal and State Agencies and Their OCS-Related Responsibilities. 1988. OCS Information Report, MMS 88-0058, 149 p.

Other Documents of Interest

The Office of Offshore Information & Publications publishes these documents that may be of interest to you. The latest editions are listed below.

- Federal Offshore Statistics: 1988, Leasing, Exploration, Production, & Revenues. 1987 Annual. OCS Report MMS 89-0082, 102 p.
- Oil and Gas Leasing/Production Program: Annual Report/FY 1987. 1988 Annual. OCS Report MMS 88-0009, 36 p.
- Offshore Scientific and Technical Publications, Spring 1989 Quarterly. Offshore Information & Publications, 32 p.
- Offshore Scientific and Technical Publications. 1984 Annual. OCS Report MMS 86-0010, 15 p.
- Offshore Scientific and Technical Publications. 1985 Annual. OCS Report MMS 87-0081, 16 p.
- Offshore Scientific and Technical Publications. 1986 Annual. OCS Report MMS 88-0055, 20 p.
- OCS Laws, Related to Mineral Resource Activities on the Outer Continental Shelf. 1985. Offshore Information Services, OCS Report MMS 85-0069, one volume.
- OCS Regulations, Related to Mineral Resource Activities on the Outer Continental Shelf. 1989. Offshore Information & Publications. MMS 88-0026, one volume.

Other Items of Interest

The OCS Information Program is now producing a map series. The following oversized plates have already been published.

- Alaska Series 89-0101
  (3 plates: Arctic, Bering, Chukchi)
- Pacific Series 89-0100
  (1 plate)

OCS Information Program Publication Staff

Program Coordinator

Douglas L. Slitor	(703) 787-1030

Author/Technical Coordinator

Gregory J. Gould	(703) 787-1029

Supporting Authors

Robert M. Karpas	(703) 787-1027
Douglas L. Slitor	(703) 787-1030

Editor/Production Supervisor

Mary J. Davis	(703) 787-1028

Technical Support

Mary Beth Barbagallo	(703) 787-1034

Production Support

Dayle Grover	(703) 787-1032

Distribution

Peggie Russell	(703) 787-1080

Place Stamp Here

OCS Information Program
Office of Information & Publications
Minerals Management Service, MS 642
381 Elden Street
Herndon, Virginia 22070-4817

MMS

Place Stamp Here

OCS Information Program
Office of Information & Publications
Minerals Management Service, MS 642
381 Elden Street
Herndon, Virginia 22070-4817

MMS

Alaska Update: September 1988-January 1990

☐ *YES! Place my name on your mailing list to receive the next update.*

Name

(Please type or print)

Organization

Adddress

City State Zip

Phone

Comments

MMS U.S. Department of the Interior
Minerals Management Service
OCS Information Program

MMS 90-0012

Alaska Update: September 1988 - January 1990

☐ *YES! Place my name on your mailing list to receive the next update.*

Name

(Please type or print)

Organization

Address

City State Zip

Phone

Comments

MMS U.S. Department of the Interior
Minerals Management Service
OCS Information Program

MMS 90-0012

N 95/ 19391

END

10-14-91